



HEXAGON
GEOSPATIAL

PRODUCT DESCRIPTION

GEOSPATIAL SDI 2018

PRODUCT FEATURES

Geospatial SDI is a suite of services installed and applied on the server side to manage and serve secure or licensed information using standards-based Web services.

Geospatial SDI is composed of a set of fully configurable Web services that interface with Open Geospatial Consortium (OGC®)-compliant services and extend their standard functionality. These additional features satisfy business-driven customer requirements, including: user authentication and authorization, service quality validation, event logging, and performance monitoring.

Geospatial SDI adheres to OGC and International Standards Organization (ISO) standards for Web services and metadata compliance. It also implements INSPIRE technical guidelines for metadata and network services.

Geospatial SDI can extend Web services based on GeoMedia® WebMap, ERDAS APOLLO, or any vendor's OGC-compliant product to assure the comprehensive set of services required for implementation of custom secure Spatial Data Infrastructure (SDI).

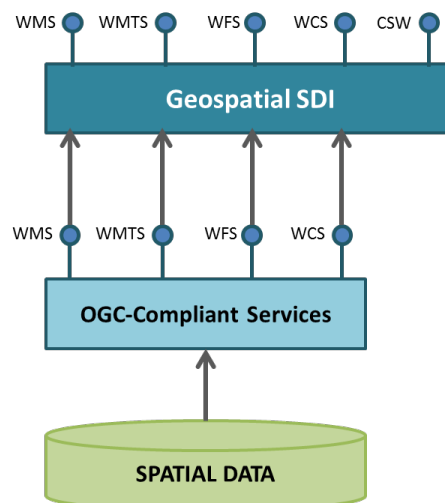


Figure 1. Geospatial SDI – General overview

Geospatial SDI includes the following services:

- CSW (Catalog Service for the Web)
- WMS Façade (Web Map Service Façade)
- WMTS Façade (Web Map Tile Service Façade)
- WFS Façade (Web Feature Service Façade)
- WCS Façade (Web Coverage Service Façade)
- INSPIRE discovery service (as CSW service)
- INSPIRE view service (as WMS façade)
- INSPIRE direct download service (as WFS façade)



KEY FEATURES

Façade architecture

Geospatial SDI functions as a façade, providing a proxy over existing OGC (WMS, WMTS, WFS, WCS) services. This architecture is also known as proxy OGC Web Service (proxy OWS), an intermediate component that allows and manages communication with OGC Web Services.

- Client application (service user) communicates directly with the façade
- Façade filters the request based on the user's granted rights and/or other criteria before passing it to the appropriate underlying OGC services
- Response can be served back to the client application as it was composed by the underlying OGC service or manipulated by the façade before return

Façade architecture also supports the use of Web services from other providers.

Security and authentication methods

Geospatial SDI enables controlled access to the OGC-compliant services. Access permissions can be granted to:

- Service instance
- Dataset, feature class (in case of WFS service) or layer (in case of WMS service)
- Spatial area

In addition, access permissions can be granted to the user for a limited time (e.g. time period, day of week, time of day) and IP address.

Service Logging

Geospatial SDI supports logging of service communication for the following items:

- Service requests can be logged for requested layers, features, BBOX, data format, coordinate system, username
- Service responses can be logged for file size, number of pixels (in the case of WMS service), number of characters, and number of objects (in case of WFS service)

Performance monitoring

Service performance parameters that can be monitored in real time include:

- Average response time
- Number of requests per minute (or other configured time period)
- Time of request initialization and completion

ISO/OGC Standards and INSPIRE Technical Guidance

Geospatial SDI services are compliant with ISO and OGC standards, technical guidance for INSPIRE Implementing Rules, or both. The following interface specifications are supported:

- WMS Façade (Web Map Service Façade)



- 1.3.0
 - ISO 19128: 2005 Geographic information -- Web map server interface
 - OGC 06-042 OpenGIS® Web Map Server Implementation Specification
 - INSPIRE Technical Guidance View Services Version 2.12
- 1.1.1
 - OGC 01-068r3 Web Map Service Implementation Specification
- WFS Façade (Web Feature Service Façade)
 - 2.0.0
 - ISO 19142: 2010 Geographic information -- Web Feature Service
 - INSPIRE Draft Technical Guidance Download Services Version 2.0
 - 1.1.0
 - OGC 04-094 Web Feature Service Implementation Specification
- WMTS Façade (Web Map Tile Service Façade) Service (1.0.0)
 - OGC 07-057r7 OpenGIS® Web Map Tile Service Implementation Standard
- WCS Façade (Web Coverage Service Façade) (1.0.0)
 - OGC 03-065r6 Web Coverage Service (WCS), Version 1.0.0
- CSW (Catalog Services for the Web) Service (2.0.2)
 - OGC 07-006r1 OpenGIS® Catalog Services Specification
 - OGC 07-045 OpenGIS® Catalog Services Specification Version 2.0.2 - ISO Metadata Application Profile
 - Technical Guidance for INSPIRE Discovery Services Version 2.12

COMPATIBLE WITH ANY OGC-COMPLIANT CLIENT

Geospatial SDI services can be consumed by any OGC-compliant client application while also ensuring secure access control. Geospatial SDI enables:

- Ubiquitous communication via OGC standard interfaces
- User authentication using IP Address or IP Address range

Additionally, Geospatial SDI can provide Vendor Specific Parameters (VSP) on top of its underlying web services, including user and password information. This information can also be incorporated in the HTTP heading. Similarly, IP addresses can be interpreted and revised by Geospatial SDI. The additional information provided by the VSP query is compatible with most OGC clients.

GEOSPATIAL SDI WEB SERVICES

Geospatial SDI provides several service templates, along with configuration files, which are used to instantiate services. Templates are provided for the following services:

Web Map Service (WMS) Façade

WMS Façade is an independent Web service that can be established on top of any OGC-compliant WMS service to extend its basic functionality with additional non-functional features. WMS Façade can modify the requests to and responses from an underlying WMS service based on the actual façade configuration, in particular, access management, logging, and performance measurement.

Façade extensions do not affect the implementation of the underlying service. Instead, façades hide the underlying service interface operations from direct access and mask them by using the corresponding operations provided by the façade.

WMS Façade operations are accessible through the HTTP/GET, HTTP/POST, and SOAP protocols.

Web Feature Service (WFS) Façade

Like WMS Façade, WFS Façade is an independent Web service that connects to its underlying OGC-compliant WFS service to modify requests to and responses from the service based on the actual façade configuration.

WFS Façade operations are accessible through the HTTP/GET, HTTP/POST, and SOAP protocols.

Web Map Tile Service (WMTS) Façade

WMTS Façade, another independent Web service, connects to its underlying OGC-compliant WMTS service to provide additional access management, logging, and performance measurement functionality.

WMTS Façade operations are accessible through the HTTP/GET protocol.

Web Coverage Service (WCS) Façade

WCS Façade Web service connects to an underlying OGC-compliant WCS service to enable additional features over a standard service interface by modification of the requests to and responses from the underlying service.

WCS Façade operations are accessible through the HTTP/GET, HTTP/POST, and SOAP protocols.

Catalog Service for the Web (CSW)

CSW supports discovery, access, and maintenance of geospatial metadata that describe data and related resources.

- Supports ISO/ OGC standards on metadata for datasets, dataset series, and services
- Supports INSPIRE Technical Guidance for metadata
- Provides functions for creating, editing, importing, exporting, managing, and storing geospatial metadata records that conform to ISO-compliant and other ISO-based metadata profiles
- Enables discovery of metadata over several federated catalogs

CSW is an OGC service specifically designed to expose a catalog of geospatial records on the Internet. As such, it is the only OGC-compliant service in the Geospatial SDI suite that directly accesses the source database to support discovery and access of geospatial metadata describing available datasets and services.

The operations of this service are accessible through the HTTP/GET, HTTP/POST, and SOAP protocols.



Authorization Bridge

Authorization Bridge is an independent Web service that supports authorization of Geospatial SDI services. As indicated by its name, it serves as a “bridge” between the Authorization Pipe and external security systems. Authorization Bridge connects to the database where permission rights are stored and verifies user permission to read the data.

An Authorization Bridge template is installed by the Geospatial SDI setup package, and can be instantiated using the Web-based Administration Console.

Security Token Service (STS)

STS provides a common access and authorization control infrastructure. It is the ideal solution if Web services need to verify clients’ identities and rights in heterogeneous environments using many different security domains, user databases, and so forth. Benefits of STS include:

- Deployed as a separate Web service that issues tokens over SLL protocol (HTTPS)
- Evaluates user credentials of any type
- Issues Security Tokens that undeniably confirm that the user is valid
 - Tokens are used for communication between the client application and services
 - Tokens are secure (signed and encrypted)
 - Tokens contain claims that store any user data including personal information, roles, permissions, etc.

SUPPLEMENTARY SERVICES

Geospatial SDI extends the primary functionality with additional Windows services.

CSW Periodic Harvest Service

The CSW Periodic Harvest service is a standalone service that pulls data into the catalog. This action only references the data to be inserted or updated in the catalog; it is the job of the catalog service to resolve the reference, fetch the data, and process it into the catalog.

- CSW Periodic Harvest service has two modes of operation:
 - Synchronous mode in which the CSW receives a Harvest request from the client, processes it immediately, and sends the results to the client while the client waits.
 - Asynchronous mode in which the server receives a Harvest request from the client and sends the client an immediate acknowledgment that the request has been successfully received, but the client does not wait for the request to be processed.
- CSW Periodic Harvest Service processes jobs in RAM by default, but also allows jobs to be saved in a database store, enabling cluster support.

Basic Log Service

The Basic Log Service is a supporting service that runs on an arbitrary machine in a network (not necessarily on the OGC service or MSM Queue host). It displays log messages from the MSM Queue and passes them to plug-in basic cartridges.

- Configure many sets of basic cartridges for many different queues so that one Basic Log Service can handle the processing of log messages for different sets of OGC services



Administration Console

Provides the means for creating and configuring all aspects of server-side engines, web services, and web applications in one place.

- Web service instances (for any type of service) can be created, configured, and removed
- The following features can be configured:
 - Service source for the facade (depending on service type)
 - Metadata (OGC and INSPIRE) configured for WMS, WMTS, CSW and WFS
 - Service logging capabilities (can be turned on and off)
 - Service performance monitoring capabilities (can be turned on and off)

Catalog Editor Utility (CEU)

CEU provides functions for creating, editing, importing, and exporting ISO-compliant geospatial metadata records. With these commands, users connect to geospatial catalog databases and query for catalog records of interest. CEU can be configured to support ISO-compliant catalog records which conform to different ISO profiles. The CEU user interface for creating and editing records can be configured to support those profiles.

- Manage, create, and modify connections to metadata catalogs
- Manage metadata records
- Manage reusable metadata elements
- Import and export metadata as XML files

Catalog Administrator Utility (CAU)

- CAU supports management of metadata catalog functions. Authorized catalog users can use CAU to connect to different geospatial metadata catalog databases and to configure security aspects of a catalog database, such as which records can be viewed or modified by which groups of users.
- Configure roles and users
- Administer record collections and operations
- Authorize administrative operations
- Create or modify records collections
- Authorize operations on metadata records for users and roles

CLOUD DEPLOYMENT

All Geospatial server products can be deployed in the cloud via Amazon Elastic Compute Cloud (EC2).



ABOUT HEXAGON GEOSPATIAL

Hexagon Geospatial helps you make sense of the dynamically changing world. We enable you to envision, experience and communicate geographic information. Our technology provides you the form to design, develop and deliver solutions that solve complex, real-world challenges. Ultimately, this is realized through our creative software products and platforms.

CUSTOMERS. Globally, a wide variety of organizations rely on our products daily including local, state and national mapping agencies, transportation departments, defense organizations, engineering and utility companies, and businesses serving agriculture and natural resource needs. Our portfolio enables these organizations to holistically understand change and make clear, reliable decisions.

TECHNOLOGY. Our priority is to deliver products, platforms and solutions that make our customers successful. Hexagon Geospatial is focused on developing technology that displays and interprets information in a personalized, meaningful way. We enable you to transform location-based content into dynamic and useable business information that creatively conveys the answers you need.

PARTNERS. As an organization, we are partner-focused, working alongside our channel to ensure we succeed together. We provide the right platforms, products, and support to our business partners so that they may successfully deliver sophisticated solutions for their customers. We recognize that we greatly extend our reach and influence by cultivating channel partner relationships both inside and outside of Hexagon.

TEAM. As an employer, we recognize that the success of our business is the result of our highly motivated and collaborative staff. At Hexagon Geospatial, we celebrate a diverse set of people and talents, and we respect people for who they are and the wealth of knowledge they bring to the table. We retain talent by fostering individual development and ensuring frequent opportunities to learn and grow.

HEXAGON. Hexagon's solutions integrate sensors, software, domain knowledge and customer workflows into intelligent information ecosystems that deliver actionable information. They are used in a broad range of vital industries.

Hexagon (Nasdaq Stockholm: HEXA B) has more than 18,000 employees in 50 countries and net sales of approximately 3.3bn USD. Learn more at hexagon.com and follow us @HexagonAB.

Copyright

© 2018 Hexagon AB and/or its subsidiaries and affiliates. All Rights Reserved. Hexagon has registered trademarks in many countries throughout the world. Visit the [Trademarks Page](#) for information about the countries in which the trademarks are registered. See Product Page and Acknowledgements for more information.

Product Documentation Terms of Use

PLEASE READ THESE TERMS CAREFULLY BEFORE USING HEXAGON GEOSPATIAL'S DOCUMENTATION ("DOCUMENT"). USE OF THIS DOCUMENT INDICATES ACCEPTANCE OF THIS AGREEMENT WITHOUT MODIFICATION. IF YOU DO NOT AGREE TO THE TERMS HEREOF ("TERMS"), DO NOT USE THIS DOCUMENT.

Use Of This Document

All materials in this Document are copyrighted and any unauthorized use may violate worldwide copyright, trademark, and other laws. Subject to the terms of this Agreement, Hexagon Geospatial (a Division of Intergraph Corporation) and Intergraph's subsidiaries ("Intergraph") hereby authorize you to reproduce this Document solely for your personal, non-commercial use. In consideration of this authorization, you agree to retain all copyright and other proprietary notices contained therein. You may not modify the Materials in any way or reproduce or publicly



display, perform, or distribute or otherwise use them for any public or commercial purpose, except as specifically authorized in a separate agreement with Hexagon Geospatial.

The foregoing authorization specifically excludes content or material bearing a copyright notice or attribution of rights of a third party. Except as expressly provided above, nothing contained herein shall be construed as conferring by implication, estoppel or otherwise any license or right under any copyright, patent or trademark of Hexagon Geospatial or Intergraph or any third party.

If you breach any of these Terms, your authorization to use this Document automatically terminates. Upon termination, you will immediately destroy any downloaded or printed Materials in your possession or control.

Disclaimers

ALL MATERIALS SUPPLIED HEREUNDER ARE PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. Hexagon Geospatial does not warrant that the content of this Document will be error-free, that defects will be corrected, or that any Hexagon Geospatial Website or the services that make Materials available are free of viruses or other harmful components.

Hexagon Geospatial does not warrant the accuracy and completeness of this Document. Hexagon Geospatial may make changes to this Document at any time without notice.

Limitation Of Liability

IN NO EVENT SHALL HEXAGON GEOSPATIAL BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, REVENUE, DATA OR USE, INCURRED BY YOU OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT OR TORT, ARISING FROM YOUR ACCESS TO, OR USE OF, THIS DOCUMENT.

Indemnification

You agree to defend, indemnify, and hold harmless Hexagon Geospatial, its officers, directors, employees, and agents from and against any and all claims, liabilities, damages, losses or expense, including reasonable attorneys' fees and costs, arising out of or in any way connected with your access to or use of this Document.

Use Of Software

Use of software described in this Document is subject to the terms of the end user license agreement that accompanies the software, if any. You may not download or install any software that is accompanied by or includes an end user license agreement unless you have read and accepted the terms of such license agreement. Any such software is the copyrighted work of Hexagon Geospatial, Intergraph or its licensors. Portions of the user interface copyright 2012-2018 Telerik AD.

Links To Third Party Websites

This Document may provide links to third party websites for your convenience and information. Third party websites will be governed by their own terms and conditions. Hexagon Geospatial does not endorse companies or products to which it links.

Third party websites are owned and operated by independent parties over which Hexagon Geospatial has no control. Hexagon Geospatial shall not have any liability resulting from your use of the third party website. Any link you make to or from the third party website will be at your own risk and any information you share with the third party website will be subject to the terms of the third party website, including those relating to confidentiality, data privacy, and security.

Trademarks

The trademarks, logos and service marks ("Marks") displayed in this Document are the property of Hexagon Geospatial, Intergraph or other third parties. Users are not permitted to use Marks without the prior written consent of Hexagon Geospatial, Intergraph or the third party that owns the Mark. "Intergraph" is a registered trademark of Intergraph Corporation in the United States and in other countries. Other brands and product names are trademarks of their respective owners.

Find additional trademark information.

Procedure For Making Claims Of Copyright Infringement

Notifications of claimed copyright infringement should be sent to Hexagon Geospatial by mail at the following address: Intergraph Corporation, Attn: Intergraph Legal Department, P.O. Box 240000, Huntsville, Alabama 35824.

US Government Restricted Right



Materials are provided with "RESTRICTED RIGHTS." Use, duplication, or disclosure of Materials by the U.S. Government is subject to restrictions as set forth in FAR 52.227-14 and DFARS 252.227-7013 et seq. or successor provisions thereto. Use of Materials by the Government constitutes acknowledgement of Hexagon Geospatial or Intergraph's proprietary rights therein.

International Use

You may not use or export Materials in violation of U.S. export laws and regulations. Hexagon Geospatial makes no representation that Materials are appropriate or available for use in every country, and access to them from territories where their content is illegal is prohibited.

Hexagon Geospatial provides access to Hexagon Geospatial international data and, therefore, may contain references or cross references to Hexagon Geospatial products, programs and services that are not announced in your country. These references do not imply that Hexagon Geospatial intends to announce such products, programs or services in your country.

The Materials are subject to U.S. export control and economic sanctions laws and regulations and you agree to comply strictly with all such laws and regulations. In addition, you represent and warrant that you are not a national of, or otherwise located within, a country subject to U.S. economic sanctions (including without limitation Iran, Syria, Sudan, Cuba, and North Korea) and that you are not otherwise prohibited from receiving or accessing the Materials under U.S. export control and economic sanctions laws and regulations. Hexagon Geospatial makes no representation that the Materials are appropriate or available for use in every country, and access to them from territories where their content is illegal is prohibited. All rights to use the Materials are granted on condition that such rights are forfeited if you fail to comply with the terms of this agreement.

Revisions

Hexagon Geospatial reserves the right to revise these Terms at any time. You are responsible for regularly reviewing these Terms. Your continued use of this Document after the effective date of such changes constitutes your acceptance of and agreement to such changes.

Applicable Law

This Document is created and controlled by Hexagon Geospatial in the State of Alabama. As such, the laws of the State of Alabama will govern these Terms, without giving effect to any principles of conflicts of law. You hereby irrevocably and unconditionally consent to submit to the exclusive jurisdiction of the United States District Court for the Northern District of Alabama, Northeastern Division, or the Circuit Court for Madison County, Alabama for any litigation arising out of or relating to use of this Document (and agree not to commence any litigation relating thereto except in such courts), waive any objection to the laying of venue of any such litigation in such Courts and agree not to plead or claim in any such Courts that such litigation brought therein has been brought in an inconvenient forum. Some jurisdictions do not allow the exclusions or limitations set forth in these Terms. Such exclusions or limitations shall apply in all jurisdictions to the maximum extent allowed by applicable law.

Questions

[Contact us](#) with any questions regarding these Terms.