

# GEOSPATIAL SDI 2018

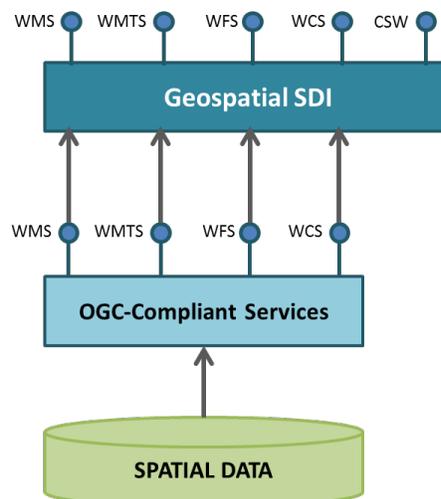
## PRODUCT FEATURES

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.



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## 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.

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### 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).



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