HOMELAND SECURITY GEOSPATIAL ENTERPRISE ARCHITECTURE

ATTACHMENT G TECH 2
GEOSPATIAL COMPONENTS

GEOSPATIAL MANAGEMENT OFFICE

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CONTENTS

1.0 INTRODUCTION

The Homeland Security (HLS) Geospatial Enterprise Architecture (GEA) Technical Reference Model (TRM) provides a conceptual framework emphasizing the role of Geospatial Information Technology (GIT) that will assist in effectively and efficiently coordinating the acquisition, creation, development, operation, and recapitalization of GIT–based systems within the HLS Target EA. This artifact summarizes the primary geospatial components in the GEA TRM.

The layers of the HLS TRM that have geospatial components are as follows:

Presentation—the technical services required to create and present application interfaces to end users,

Business Logic—application-specific logic representation; that is, "software,"

Application Infrastructure—the technical services required to allow business logic, and other application logic to function,

Integration Services—the technical services and components required to interchange data among applications and services,

Data Management —the technical services and components required to access and modify data of all types, and

Computing Platform—physical hardware and operating system services that support the components of the Service Framework.

The geospatial components are presented in tabular form to illustrate the placement of these components within the layers of the TRM.

2.0 HLS GEOSPATIAL COMPONENTS

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Presentation	Web Client	Map Viewer Plug-in	The means to visualize and interact with geospatial data in rendered map form. Provides tools to select base map/image data for viewing, select optional graphics overlays (geospatial features, locations, structures, routes, observations, mobile-objects), set view window, display chosen view, measure and pinpoint, navigate through view with pan and zoom, etc. Optionally choose symbology, map display template or select previous views.
Presentation	Web Client	Graphics Viewer Plug-in	The means to visualize and interact with 2D and 3D geospatial data in graphics form, where the user may interact/change geospatial elements. Provides tools to select geospatial features/locations/structures/routes/observations/mobile-objects for viewing, set view window, display chosen view, measure and pinpoint, navigate through view with pan and zoom, etc. Optionally choose symbology, graphics display template or select previous views.
Presentation	Web Client	Image Viewer Plug-in	The means to visualize and interact with geospatial images (rectified or unrectified). Provides tools to select image and optional graphics overlays for viewing (geospatial features/locations/structures/routes/observations/mobile-objects), set view window, display chosen view, measure and pinpoint, navigate through view with pan and zoom, etc. Optionally choose symbology, image display template or select previous views.
Presentation	Messaging Client	Location-Based Messaging Client	The means to visualize location-based messages (messages with embedded geospatial elements). Example messages include alerts, warnings, emergency declarations, location report and situation reports.
Presentation	Office Suites & Personal Productivity Tools	Personal Map Software	Personal Map Software includes a variety of tools for viewing, annotating and manipulating map data. Typically include map data for standalone operations. Often includes Global Positioning System (GPS) capability for mobile applications. Commercial software for desktop or Personal Digital Assistant (PDA).

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Presentation	Collaboration Client	COP Manager Client	The Common Operating Picture (COP) Manager provides the means to manage the scope and resources associated with a COP, select and allocate resources, manage and monitor collaboration activities, monitor status and performance of resources, and monitor and manage external communications. The distinction between the COP Manager and other operations applications is that the COP Manager is managing the big picture, whereas other applications focus on Mission-Specific Operating Pictures (MSOP) and other mission-specific operation activities. Matches up with COP Manager Server Tier 3 component.
Presentation	Geospatial Client	Specialized Geospatial Clients (Various)	A desktop client, either thick or thin, that provides visualization and interaction with geospatial data. Also provides access to underlying Application Components and Geospatial Services. Many specialized geospatial applications will exist within the HLS EA, each which may have a Geospatial Client and one or more Application Components and/or Geospatial Services. Matches up with server-side Geospatial Application Components Tier 3 component.
Presentation	Geospatial Client	Geographic Information System (GIS) Client	A general purpose GIS client, either thick or thin, that provides visualization and interaction with geospatial data. Matches up with GIS Server Tier 3 component. May also provide access to underlying Application Components and Geospatial Services.
Presentation	Geospatial Client	Image Processing Client	A desktop client, either thick or thin, that provides visualization and interaction with geospatial imagery data. Many specialized geospatial imagery applications may exist within the HLS EA. Matches up with Image Processing Server Tier 3 component. May also provide access to underlying Application Components and Geospatial Services.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Business Logic	Application Components	Geospatial Application Components	Specialized Geospatial Applications may have one or more server-side Geospatial Application Components. These server-side components contain geospatial business logic and reference Geospatial Enterprise Services, which are common geospatial services that are available throughout the enterprise. Geospatial Application Components match up with the Specialized Geospatial Clients Tier 3 components.
Business Logic	Geospatial Servers	GIS Server	The GIS server is comprised of bundled services that support the generation, revision, management, processing, and output of geospatial data. Consists of the server-side components comprising a GIS. These server capabilities match up with the GIS Client Tier 3 component.
Business Logic	Geospatial Servers	Image Processing Server	The Image Processing System (IPS) server is comprised of bundled services that support the generation, revision, management, processing, and output of geospatial image data. Consists of the server-side components comprising an IPS. These server capabilities match up with the Image Processing Client Tier 3 component.
Application Infrastructure	Geospatial Enterprise Server	Data Discovery Service	Able to search for and locate desired data through open, standard publish-find mechanisms. Search requests may be defined in terms of geospatial-temporal, mathematical and statistical filters for discovering data and data relationships, and optionally storing the metadata results as a new data set.
Application Infrastructure	Geospatial Enterprise Server	Service Discovery Service	Able to search for and locate desired services through open, standard publish-find mechanisms. Search requests may be defined in terms of filters for discovering services and service-data relationships, and optionally storing the metadata results as a new data set.
Application Infrastructure	Geospatial Enterprise Server	Map Publication Service	Able to automatically generate and publish Maps of interest for inclusion in a plan, report, or other Geospatial Product, with select content and symbolization (map template). To produce a Map for inclusion in a word or graphic document.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Activity Report Service	Able to generate an Activity Report for any location-based activity.
Application Infrastructure	Geospatial Enterprise Server	After Action Report Service	Able to generate an After Action Report with the geospatial context of the root cause, status and recommendations pertaining to post-incident recovery operations.
Application Infrastructure	Geospatial Enterprise Server	Alert-Warning Report Service	Able to generate an Alert-Warning Report with information about location-based alert or warning messages.
Application Infrastructure	Geospatial Enterprise Server	Emergency Declaration Report Service	Able to generate an Emergency Declaration Report with the geospatial extent and nature of an emergency.
Application Infrastructure	Geospatial Enterprise Server	Incident Report Service	Able to generate an Incident Report with information about a location-based incident message.
Application Infrastructure	Geospatial Enterprise Server	Location (Site) Report Service	Able to generate a Location Report with information about an HLS data object's location, related entities, and geospatial context. Example objects include geospatial feature, person, asset, conveyance, goods, cargo, device, etc.
Application Infrastructure	Geospatial Enterprise Server	National Security Special EVENT (NSSE) Report Service	Able to generate a NSSE Report for an EVENT.
Application Infrastructure	Geospatial Enterprise Server	Situation Report Service	Able to generate a Situation Report with the geospatial extent and nature of an operational situation.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Suspicious Activity Report Service	Able to generate a Suspicious Activity Report for a location-based suspicious activity.
Application Infrastructure	Geospatial Enterprise Server	Coverage Portrayal Service	Coverage Portrayal Service is chained to a Web Coverage Service (WCS) to convert geospatial coverage data (grid/image) to a map. The resultant map can be overlaid with data fetched from other servers for reference and orientation.
Application Infrastructure	Geospatial Enterprise Server	Web Map Service (WMS)	The means to render 2D maps. See WMS Tier 3 component.
Application Infrastructure	Geospatial Enterprise Server	Web Terrain Service (WTS)	The means to render 3D views of geospatial data. See WTS Tier 3 component.
Application Infrastructure	Geospatial Enterprise Server	Style Management Service (SMS)	The means to create, update and manage styles and symbols. The Style Management Service (SMS) must manage distinct objects that represent styles and symbols and provide the means to discover, query, insert, update, and delete these objects. Styles provide the mapping from feature types and feature properties and constraints to parameterized Symbols used in drawing maps. Symbols are bundles of predefined graphical parameters and predefined fixed graphic "images".

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Geocoder/Reverse Geocoder Services	Able to determine geospatial coordinates, given an address (Geocoder), or determine address, given geospatial coordinates (Reverse Geocoder). A Geocoder transforms a description of a feature location, such as a place name, street address or postal code, into a normalized description of the location, which includes coordinates. A Geocoder Service receives a description of a feature location as input and provides a normalized address with coordinates as output. The feature location descriptions are any terms, codes or phrases that describe the features, and that are well-known to the Geocoder Service, such as a street addressing or postal coding scheme. These services are very important across the HLS enterprise, as they enable enterprise users to exploit the geospatial-temporal context of the wide diversity of HLS business data that contain Location References, such as address, building name, census tract, etc. They are also key to correlating, integrating and fusing dissimilar data on the basis of geospatial-temporal characteristics.
Application Infrastructure	Geospatial Enterprise Server	Geolocate Service	The means to determine a location for a fixed or Mobile Object of interest (e.g., geospatial feature, person, asset, conveyance, goods, cargo, device, etc.) Mobile Objects must be equipped with GPS, Radio Frequency Identification Device (RFID), and/or other position determination technologies.
Application Infrastructure	Geospatial Enterprise Server	Gateway Service	The Gateway Service determines the geospatial position of a known mobile terminal from a wireless network. Position is expressed in geographic coordinates. Mobile terminals (cell phones, PDAs, etc) must be equipped with GPS or some other position determination technology. An important service used in Location-Based Services (LBS), in the wireless realm.
Application Infrastructure	Geospatial Enterprise Server	Route Service	Able to determine (or fetch a predetermined) route and navigation information for autonomous or semi-autonomous navigation between two or more points on a network. An important service used in LBS, in the wireless realm.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Navigation Service	An enhanced version of the Route Service, which determines routes between two or more points with enhanced navigation information. An important service used in LBS.
Application Infrastructure	Geospatial Enterprise Server	Monitoring Service	Able to determine (or fetch a predetermined) location/time/identity/status/activity series for a Location.
Application Infrastructure	Geospatial Enterprise Server	Tracking Service	Able to determine (or fetch a predetermined) location/time/velocity/identity/status/activity series (track) for a Mobile Object (e.g., persons, goods, assets, devices, etc.)
Application Infrastructure	Geospatial Enterprise Server	Weather Service	The means to access weather conditions for an area of interest or location for a specified time period.
Application Infrastructure	Geospatial Enterprise Server	Traffic Service	The means to access traffic information regarding incidents and/or conditions for a specified area of interest, road, or road segment, for a specified time period. Also, the means to access traffic information regarding incidents and/or conditions for a designated route (that has been determined by a Route Service or Navigation Service) for a specified time period.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Model Access Service	Able to determine and access the extent and nature of a Toxic Dispersion Model (e.g., plume) for a chemical or biological event in air or water. The model output is characterized by features. "Toxic Dispersion" refers to the effects of introducing a chemical, radioactive or biological agent into the atmosphere or a water supply at a point source. Simulation is employed to understand the effects of a toxic agent within its medium. The objective of the simulation is to ascertain contamination levels in a geospatial-temporal context, and thus, to understand the nature of toxic plumes, danger zones, warning zones, and related features, and to be able to view or analyze the output from a simulation run in conjunction with any other geospatial data, e.g., as plumes or danger/warning zones within a geospatial decision support tool. Also, the ability to determine and access weather, hydrographic and other environmental parameters through environmental simulation. The simulation output is characterized by observations.
Application Infrastructure	Geospatial Enterprise Server	Geoparser Service	Geoparsing refers to the capability to scan and parse a textual document, identifying key words and phrases that have geospatial-temporal context. A Geoparser Service works in the context of two bodies of information: a reserved vocabulary (a dictionary of place names, a gazetteer or a directory of Points of Interest) and a text source (e.g., a newspaper or cable.) The Geoparser returns all occurrences of the use (in the text source) of any term in the reserved vocabulary. Each occasion establishes a geolinks (geospatial/temporal-aware hyperlink) between text terms and the geospatial location associated with the reserved word. That result is an annotated text document with geolinks.
Application Infrastructure	Geospatial Enterprise Server	Sensor Planning Service	A service by which a client can determine sensor collection feasibility for a desired set of collection requests for one or more mobile sensors/platforms, or the client may submit collection requests directly to these sensors/platforms.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Application Infrastructure	Geospatial Enterprise Server	Sensor Collection Service	A service by which a client can obtain observations from one or more sensors/platforms (can be mixed types). Clients can also obtain information that describes the associated sensors and platforms.
Application Infrastructure	Geospatial Enterprise Server	Sensor Alert Service	The Sensor Alert Service produce alert messages when given observation conditions are met by a sensor. Provides the means for client services/users to specify and register user profiles that contain user information, applicable sensors/observations, alert conditions (e.g., maximum/minimum values), and alert actions (what happens if conditions are met). Also, the means for client services/users to update user profiles. Clients are able to control the nature of alerts. For example, a client is able to activate/deactivate an alert capability. Also provides the means to support push/pull capabilities, e.g., to wait for observation input from associated sensors (for on/off sensors like a detector), or to actively poll for (current/historical/predicted) sensor observations.
Application Infrastructure	Collaboration Server	COP Collaboration Server	A Collaboration Server for managing and monitoring shared COP/MSOP resources and the collaborative exchange of geospatial data.
Application Infrastructure	Collaboration Server	Web Notification Service	A service by which a client may conduct a dialog with one or more other services. This service is useful when many collaborating services are required to satisfy a client request, and/or when significant delays are involved is satisfying the request, which is often the case in the geoprocessing realm.
Data Interchange/ Integration	Inter-Application Services	Geospatial Integration Broker	A key component used in moving geospatial data between systems. Involved in data sharing and collaboration operations in support of the COP and MSOP. Involved in Geospatial Data Rollup (GDR) Operations.
Data Interchange/ Integration	Web Services	Semantic Interoperability Services	Fully autonomous business, service and data interoperability is only possible when clients can locate and access business, service and data on-the-fly through publish-find-bind-orchestration patterns that subscribe to well-known business, service and data semantics.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Data Interchange/ Integration	Inter-application Message Services	Location-Based Messaging Service	The means to represent location-based messages (messages with embedded geospatial elements). Location-based messages include alerts, after action reports, warnings, emergency declarations, location reports, situation reports and NSSE Reports. The Location Organizer Folder (LOF) is a standard message container model for capturing multi-media data in a geospatial context. It is based upon eXtensible Markup Language (XML) and Geography Markup Language (GML).
Data Management	Data Access Services	Web Map Service (WMS)	A Web Map Service (WMS) is able to access vector and raster data and render it in the form of a map for display (combines access and portrayal). Independent of whether the underlying data are features (point, line and polygon) or coverages (such as gridded digital terrain model or images), the WMS produces an image of the data that can be directly viewed in a web browser or other picture-viewing software. A WMS labels its data as one or more "Layers," each of which is available in one or more "Styles." Upon request a WMS makes an image of the requested Layer(s), in either the specified or default rendering Style(s). Typical output formats include Portable Network Graphics (PNG), Graphics Interchange Format (GIF), Joint Photographic Expert Group format (JPEG), and Tagged Image File Format (TIFF).
Data Management	Data Access Services	Web Coverage Service (WCS)	Able to access geospatial coverage data (e.g. imagery and digital terrain model (DTM)). The Web Coverage Service (WCS) supports the networked interchange of geospatial data as "coverages" containing values or properties of geographic locations. Unlike the WMS, which filters and portrays spatial data to return static maps (server-rendered as pictures), the WCS provides access to intact (unrendered) geospatial information, as needed for client-side rendering, multi-valued coverages (such as multi-spectral images and terrain models), and input into scientific models and other clients beyond simple viewers.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Data Management	Data Access Services	Web Feature Service (WFS)	The Web Feature Service (WFS) supports the query and discovery of geographic features (represented in vector form). In a typical Web access scenario, WFS delivers GML representations of geospatial features. Clients (service requestors/consumers) access geographic feature data through a WFS by submitting a query for just those features that are needed for an application. The client generates a request and posts it to a WFS server on the Web. The WFS instance executes the request, returning the resulting geographic features to the client encoded in GML. A GML-enabled client can manipulate or operate on the returned geographic features.
Data Management	Data Access Services	Gazetteer Service	Able to access a Gazetteer, which is a directory of well-known places and their locations. It generally consists of point features. A Gazetteer Service is a network-accessible service that retrieves one or more features, given a query (filter) request. This filter request must support selection by well-known feature properties. Queryable feature properties include, but are not limited to, feature type, feature name, authority, or identification code. Each instance of a Gazetteer Service has an associated vocabulary of identifiers. Thus, a Gazetteer Service may apply to a given region, such as a country, or some other specialized grouping of features. The returned features will include one or more geometries expressed in a well-known Coordinate Reference System.
Data Management	Data Access Services	Web Terrain Service (WTS)	The Web Terrain Service (WTS) extends the WMS interface to allow the access and portrayal of three dimensional geospatial data. This service can be exploited to perform tasks such as terrain analysis, mission planning, and fly-throughs.
Data Management	Data Access Services	(Location) Directory Service	The (Location) Directory Service provides access to online directories of persons, places, products and/or services (e.g., Yellow/White/Green/Blue Pages, Restaurant/Travel/Entertainment Guides, Community Services, etc). This service is ordinarily used to find the location of a specific or nearest person, place, product and/or service. It is an important service used in LBS.
Data Management	Data Access Services	Inage Archive Service	The Image Archive Service accesses archived images. It makes use of WCS and Image Catalog Service (ICS) Tier 3 components.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Data Management	Data Access Services	Web Annotation Service	The Web Annotation Service is a specialized WFS that accesses map/image annotations. It is based upon the XML for Image and Map Annotation (XIMA), which defines an XML vocabulary to encode annotations on imagery, maps, and other geospatial data. This vocabulary draws on the GML to express the positions of these annotations in geographic (real world) or image-pixel coordinates, and to associate each annotation with the geospatial resource(s) it describes. The XIMA encoding is useful for any activity that requires linking or tagging geospatial data in order to present and discuss it with others, to make joint decisions, or to communicate spatially.
Data Management	Data Access Services	Digital Rights Management Services	Digital Rights Management Services provide secure, managed access to geospatial data provided by private providers/stewards for mission-critical HLS business activities. This is crucial for operations that involve Critical Infrastructure and Key Assets.
Data Management	Data Cataloguing and Metadata Management Services	Web Registry Service (WRS)	The WRS provides a common mechanism to classify, register, describe, search, maintain and access information about geospatial resources available on a network. Resources are network addressable instances of typed data or services. Types of registries are differentiated by their role such as registries for cataloging geospatial resource types (e.g., types of geographic features, coverages, sensors, symbols, services, etc), online data instances (e.g., geospatial and image datasets and repositories, application schema, and symbol-style libraries), and online instances of services.
Data Management	Data Cataloguing and Metadata Management Services	Catalog Service	The Catalog Service defines common information models and standard operations that allow applications and services to interact with registry instances, regardless of their role or content, in order to discover, access and manage geospatial resources (data and services). Specialized Catalog Services may exist for specific data classes, e.g., an ICS.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Data Management	Data Transformation Services	Coordinate (and Unit) Transformation Service	The ability to transform geospatial data between different coordinate reference systems, datums and units. Support map re-projections on-the-fly for map viewing, as well as permanent coordinate transformations that result in a transformed output data set.
Data Management	Data Transformation Services	Geospatial Data Format Conversion, Import/Export Services	Able to import/export, manipulate and convert geospatial data, through standard services. Formats include GML, MapInfo, ESRI, Intergraph, etc.
Data Management	Data Transformation Services	Topology Services	Able to detect topology errors (e.g., overshoots and undershoots of common linear and polygonal features within a definable tolerance), automatically correct errors, if possible, and define topological relationships between connected/collocated linear, polygon, and point features.
Data Management	Database Management System (DBMS)	Native Spatial DBMS	The Enterprise DBMS should provide native support for storing and managing all types of geospatial data. Capabilities should include geospatial indexing, open Structured Query Language (SQL) support with geometry and topology operators, geospatial analytics, geospatial data mining, coordinate transformation and linear referencing.
Computing Platform	Computer Hardware	Geospatial Processing Workstation	A Geospatial Processing Workstation is a high-end workstation dedicated to GIS, Image Processing and other demanding geospatial processing tasks. Geospatial Processing workstations may be Unix or Windows based. They typically are characterized by large memory, large screen video, and massive disk storage.
Computing Platform	Remote Sensing Hardware	Photogrammetric Cameras	Cameras that are specialized for the remote capture and measurement of panchromatic (350-1100 nm) data of the earth's surface. These units are typically mounted on airborne craft and produce photographs that can be transformed into a geo-registered image product using specialized photogrammetric software applications.

HLS TRM Tier 1	HLS TRM Tier 2	HLS TRM Tier 3	Component Description
Computing Platform	Remote Sensing Hardware	Multi-spectral Scanners	Any device that is specialized for measuring radian energy of the earth's surface using discrete bands of spectral data ranging from the blue to the near-infrared portions of the electromagnetic spectrum.
Computing Platform	Remote Sensing Hardware	Hyper-spectral Scanners	Any device that is specialized for measuring radian energy using contiguous bands of spectral data across a broad range of electromagnetic spectra. The resulting image can be visualized as a 3-dimensional dataset with two spatial and one spectral dimension, which is often referred to as an image cube.
Computing Platform	Remote Sensing Hardware	Light Detection and Ranging (LiDAR)	LiDAR is an active remote sensing system that can be operated in either a profiling or scanning mode using pulses of light to illuminate the terrain. By accurately measuring the round trip travel time of the laser pulse from the aircraft to the ground, a highly accurate spot elevation can be calculated.
Computing Platform	Remote Sensing Hardware	Synthetic Aperture Radar (SAR)	A microwave instrument that transmits radar pulses very rapidly. In fact, SAR is generally able to transmit several hundred pulses while the platform passes over a particular object. Many backscattered radar responses are therefore obtained for that object, which can be manipulated such that the resulting image looks like the data were obtained from a big, stationary antenna. In general, the synthetic aperture is the distance traveled by the spacecraft while the radar antenna collected information about the object.
Computing Platform	Remote Sensing Hardware	Interferometric SAR (InSAR)	Interferometric Synthetic Aperture Radar (InSAR) is a technique that enables measurement of very small movements of the earth's surface, as subtle as centimeters or less. The SAR interferometry technique acquires a pair of images from two radar measurements, taken from two marginally displaced coherent observations of the surface. For each pixel corresponding to the same ground area in both images, phase values are differenced to produce an interferogram, which, using the orbit parameters, is subsequently used to produce a DTM.

3.0 ACRONYMS

Acronym	Definition
COP	Common Operating Picture
DBMS	Database Management System
DHS	Department of Homeland Security
DTM	Digital Terrain Model
EA	Enterprise Architecture
ESRI	Environmental Systems Research Institute
GDR	Geospatial Data Rollup
GEA	Geospatial Enterprise Architecture
GIF	Graphics Interchange Format
GIS	Geographic Information System
GIT	Geospatial Information Technology
GML	Geography Markup Language
GPS	Global Positioning System
HLS	Homeland Security
ICS	Image Catalog Service
InSAR	Interferometric Synthetic Aperture Radar
IPS	Image Processing System
JPEG	Joint Photographic Expert Group
LBS	Location-Based Services
LiDAR	Light Detection and Ranging
LOF	Location Organizer Folder
MSOP	Mission-Specific Operating Picture
NSSE	National Security Special Event
PDA	Personal Digital Assistant
PNG	Portable Network Graphics
POI	Point Of Interest
RFID	Radio Frequency Identification Device
SAR	Synthetic Aperture Radar

SMS	Style Management Service
SQL	Structured Query Language
TIFF	Tagged Image File Format
TRM	Technical Reference Model
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service
WRS	Web Registry Service
WTS	Web Terrain Service
XIMA	XML for Image and Map Annotation
XML	eXtensible Markup Language