OGC
Open Geospatial Consortium

Standards Enhance The Data by making it less costly and easier to share and use

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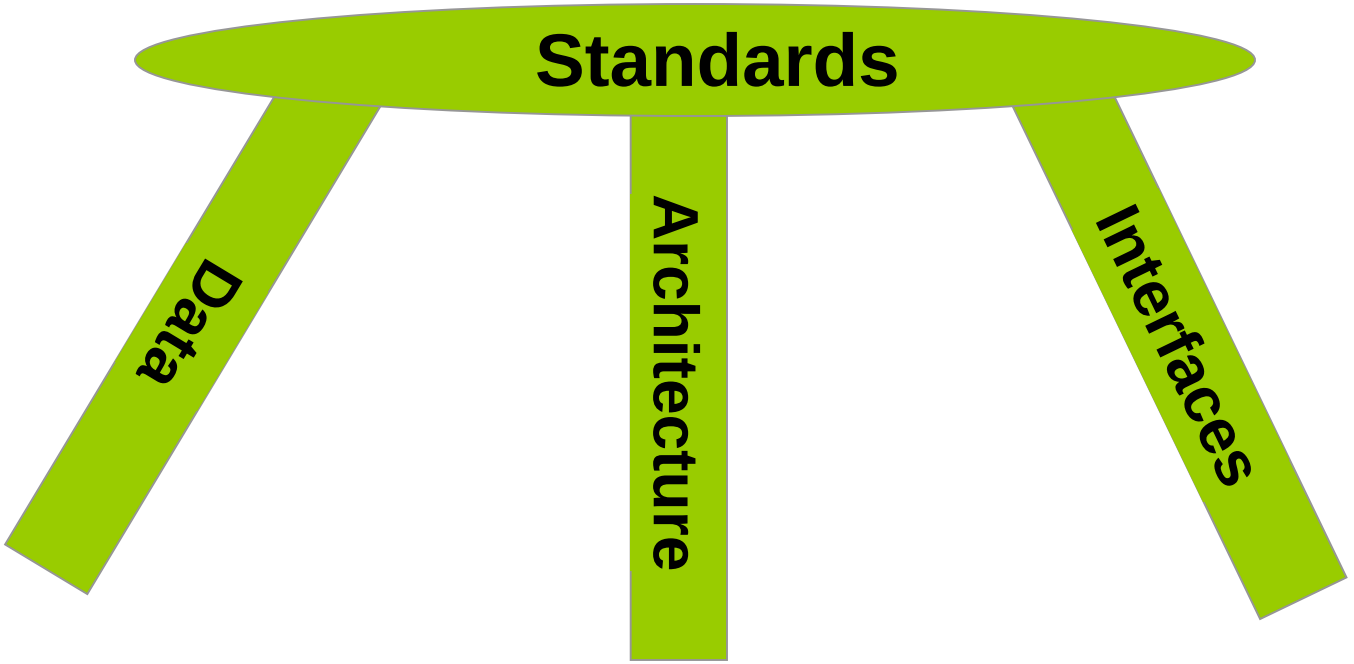
The Three Legged Stool



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The Legs of the Standards Stool

- Data
  - Communities of Interest (FIG) define their own content models – Standardized Cadastral Data Model (SCDM)
  - Encoded in industry standard encoding (OGC extension of XML) for ease of sharing and exploitation
- Interfaces
  - Connections between computer components (OGC)
- Architecture
  - Defines framework onto which components are hung (OGC)

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OGC Background

- **Open Geospatial Consortium (OGC)**
  - Not-for-profit, international voluntary consensus standards organization
    - Incorporated in US, UK, Australia
  - 270+ industry, government, and university members
  - Class A Liaison of ISO TC 211, TC 204 and CEN TC 287
  - Founded in 1994

OGC Mission

To lead in the development, promotion and harmonization of open spatial standards,

to support their effective implementation in ICT infrastructure architectures worldwide, and to advance the formation of new market opportunities for spatial information and processing services.

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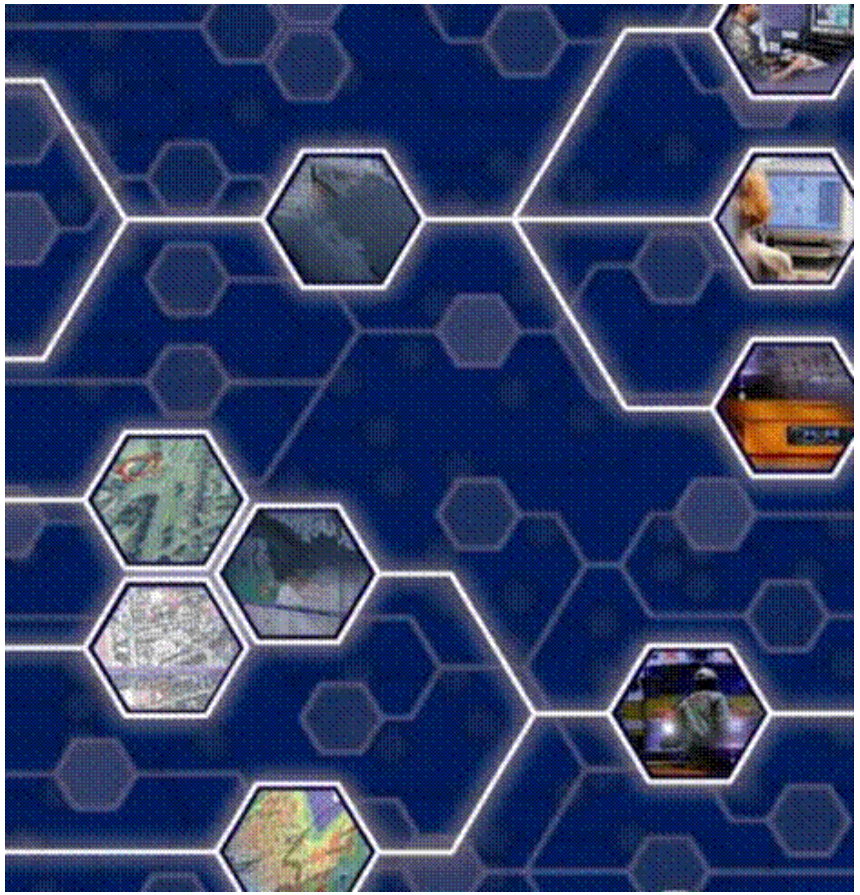
OGC Vision

A world in which everyone benefits from geographic information and services made available across any network, application, or platform.



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How the FIG SCDM fits

- SCDM will provide cadastral community of practice consensus on what data needs to be captured and shared
  - Attributes of a parcel
  - Geometry of a parcel
    - Accuracy
    - Data type – point, line area
- Open GIS ® Geography Markup Language (GML) encoding of XML that describes the features and geometry of the cadastral model will enable those data to fit easily into multiple technology packages
  - Moving through ISO TC 211 as ISO 19136 – Draft International Standard to be published after vote this fall

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What OGC Provides

- Interfaces
  - Industry consensus that determines how software components communicate with one another
    - Open GIS Web Map Service, Open GIS Web Feature Service
- Architecture
  - Defines the ‘electrical power grid’ for Information Technology world
  - You can buy an adapter that will plug a U.S. appliance into an European socket, but it still won’t work without changing the voltage and hertz of the power delivered
  - Open GIS Reference Model (ORM) and Technical Baseline guide definition of the system into which the components ‘plug’

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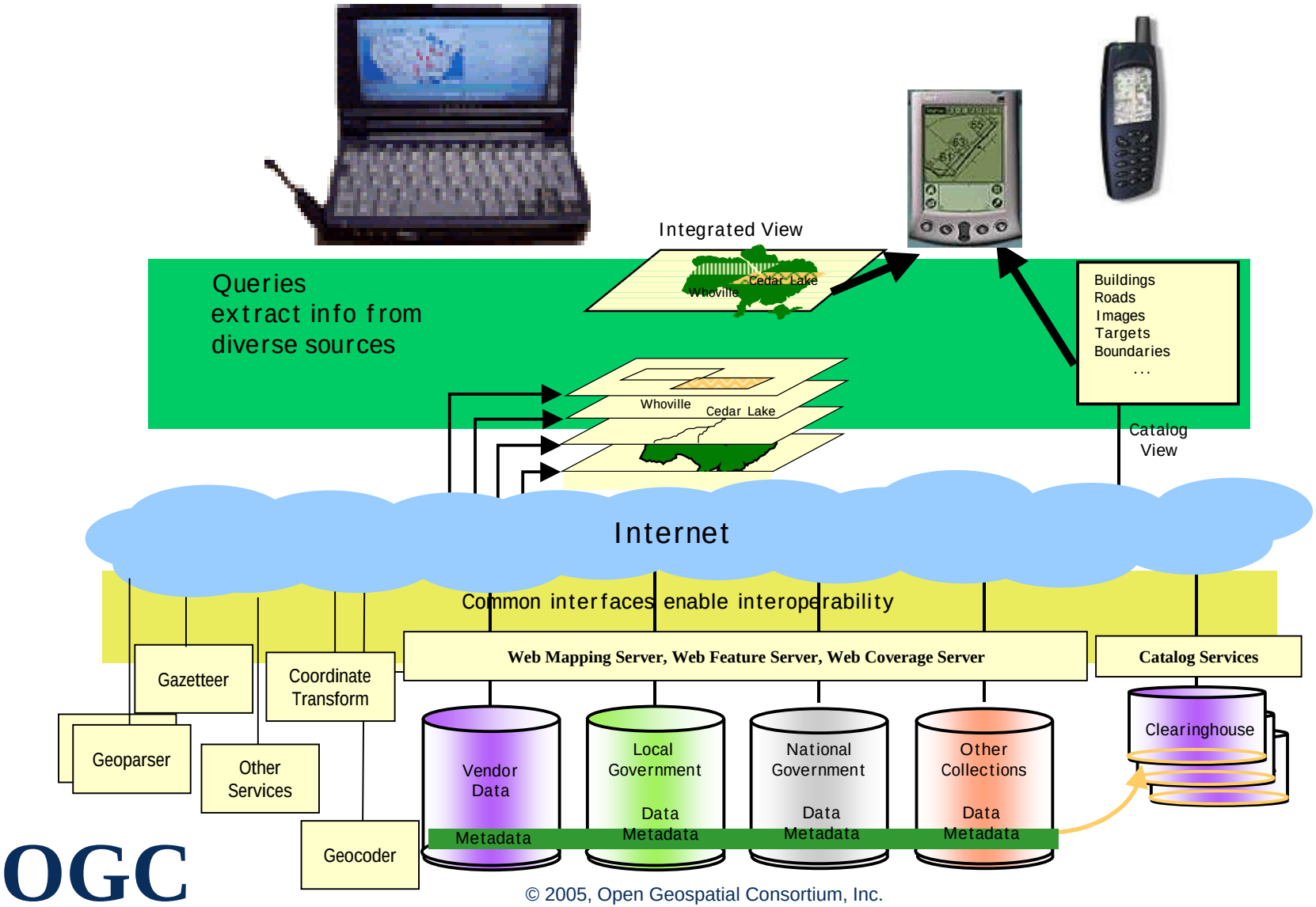
Kentucky Landscape Census (KLC) Pilot Project



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How KLC Works

- KLC is a statewide distributed network serving cadastral data, and land cover data – basic classification and change detection images
  - Existing Kentucky map service, The Commonwealth Map, provides background maps that are provided using OpenGIS ® WMS interface
- Uses FGDC Framework Data Model for Cadastral service
  - Pilot with 4 counties that will serve the FGDC FDM for free
  - Additional information, access to more than a handful of parcels at a time is sold – each county has different mix of data available and different pricing scheme
  - Kentucky e-gov handles the billing part of the process
- KLC differs from most other systems in that the county data: cadastral, imagery and road centerlines remain at the county and are not aggregated at the state
  - Saves large cost of data aggregation and management
  - Ensures a query returns the latest state of the data – not an update from last year

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The ‘Tipping Point”

- Geospatial information, like anything with economic value, is used because the value of using it is greater than the cost of using it.
- Industry after industry has benefited from standardization and grown as costs have fallen:
  - Cars, computers, home entertainment systems, etc.

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Requirements to Realize that Vision

- Data that is discoverable and semantically interoperable
  - The first requirement for sharing is knowing the data exists
  - The second requirement for sharing is reading the format
  - The third requirement for sharing is ‘knowing’ what a road is
- Services that automatically overcome all three barriers
- Architecture into which the services fit
  - You plug your new stereo into the wall for power and into the rest of your system to make it work – why not geospatial processing too?
- All three rely on open, industry consensus standards to fit the pieces together – multi-jurisdictional players means multi-vendor software

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Who Belongs to OGC in the U.S.?

- Vendors
  - Autodesk, Compusult, Cubewerx, ESRI, Galdos, Intergraph, Ionic, Laser Scan Ltd., ObjectFX, MapInfo, NAVTEQ, Tele Atlas
- Integrators
  - BAE Systems, Boeing S&IS, Booze Allen Hamilton, Harris Corp, ITT Industries, Lockheed Martin, Michael Baker, Jr., Northrop Grumman – TASC, Parsons Brinckerhoff, Raytheon, SAIC, Titan Corporation
- Universities
  - Alabama – Huntsville, Arkansas, Columbia, MIT, GMU Harvard, Illinois, Indiana, Penn State, Maine, Maryland, Michigan State, Minnesota, Washington U in St. Louis

My apologies, if I missed your organization – entire list available at: http://www.opengeospatial.org/about/?page=members&view=Name

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Who Belongs to OGC?

- U.S. Government Organizations
  - U.S. Defense Modeling & Simulation Office (DMSO)
  - U.S. Naval Research Laboratory
  - Program Executive Office, C4I and Space
  - US Army Corps of Engineers (ACE)
  - US Census Bureau
  - US Environmental Protection Agency (EPA)
  - US Federal Emergency Management Agency (FEMA)
  - US Federal Geographic Data Committee (FGDC)
  - US Geological Survey (USGS) National Mapping Division
  - US National Aeronautics and Space Administration (NASA)
  - US National Geospatial-Intelligence Agency (NGA)
  - US National Oceanic and Atmospheric Administration (NOAA/NCDDC)

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Who Belongs to OGC World Wide?

- Vendors
  - Compusult, Cubewerx, ESRI Canada, Galdos, Laser Scan Ltd., Tele Atlas, AED Sicad,
- Integrators
- Universities
  - University of Muenster, University of London,

My apologies, if I missed your organization – entire list available at: http://www.opengeospatial.org/about/?page=members&view=Name

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Who Belongs to OGC World Wide?

- Governments
  - EC Joint Research Center, European Space Agency,

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What is OGC Interoperability?

- The ability of systems to exchange and use information and services through the application of open standards.
  - By "systems," we mean software processes, services and other components, including data, semantics, hardware, and networks.
- OGC has developed an open framework that enables spatial interoperability among information communities and enterprises.
  - specifications that describe open, vendor-neutral, and non-proprietary interfaces, encodings and ontologies developed in a voluntary consensus-based process.

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The Value of Interoperability

- The value of interoperability is easy to understand because the World Wide Web provides the ideal example. Millions of implementations of the specifications for TCP/IP, HTTP, HTML, XML and other related standards make possible a huge network of interoperating software processes, services, data, semantics, hardware, and networks. The OGC works to make geospatial information and services a fluid part of the World Wide Web, and to likewise enable interoperability across networks, systems and enterprises.

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OGC Web Service (OWS) Architecture

- Open GIS ® Reference Model (ORM) – architecture document that illustrates how services are provided using open, industry consensus interface and encoding standards
  - http://www.opengeospatial.org/specs/?page=orm
- Essential to success:
  - The National Map by USGS
  - Geospatial One-Stop by USGS
  - DHS HLS Geoarchitecture
  - Canada Geospatial Data Infrastructure (CGDI)
- OGC Technical Baseline – latest version of standards
  - http://www.opengeospatial.org/specs/?page=orm

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OGC Web Services Family

- Catalog Service (CS) CS-W Profile
- Filter Encoding (FE)
- Geography Markup Language (GML)
- GO-1 Application Objects (GO-1)
- Web Services Common (WSC)
- Styled Layer Descriptor (SLD)
- Web Coverage Service (WCS)
- Web Feature Service (WFS)
- Web Map Context (WMC)
- Web Map Service (WMS)

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OGC Web Services - 1

Open GIS ® Catalog Services	2.0	2004-08-02	Defines a common interface that enables diverse but conformant applications to perform discovery, browse and query operations against distributed and potentially heterogeneous catalog servers.
Open GIS ® Coordinate Transformation Services	1.0	2001-01-12	Provides interfaces for general positioning, coordinate systems, and coordinate transformations.
Open GIS ® Filter Encoding	1.1	2005-05-03	This document defines an XML encoding for filter expressions based on the BNF definition of the OpenGIS Common Catalog Query Language as described in the OpenGIS Catalog Interface Implementation Specification, Version 1.0 [2].
Open GIS ® Geography Markup Language	3.1.1	2005-05-03	The Geography Markup Language (GML) is an XML encoding for the transport and storage of geographic information, including both the geometry and properties of geographic features.

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OGC Web Services - 2

Open GIS ® GO-1 Application Objects (AOS)	1.0.0	2005-05-04	The GO-1 Application Objects specification defines a set of core packages that support a small set of Geometries, a basic set of renderable Graphics that correspond to those Geometries, 2D device abstractions (displays, mouse, keyboard, etc.), and supporting classes. Implementation of these APIs will support the needs of many users of geospatial and graphic information.
Open GIS ® Grid Coverages (GC)	1.0	2001-01-12	This specification was designed to promote interoperability between software implementations by data vendors and software vendors providing grid analysis and processing capabilities.
Open GIS ® OGC Web Services Common Specification (Common)	1.0	2005-05-03	This document specifies many of the aspects that are, or should be, common to all or multiple OWS interface Implementation Specifications. Those specifications currently include the Web Map Service (WMS), Web Feature Service (WFS), and Web Coverage Service (WCS).

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OGC Web Services - 3

Open GIS ® Simple Features - SQL (SFS)	1.1	1999-05-05	The Simple Feature Specification application programming interfaces (APIs) provide for publishing, storage, access, and simple operations on Simple Features (point, line, polygon, multi-point, etc).
Open GIS ® Styled Layer Descriptor (SLD)	1.0	2002-08-19	The SLD is an encoding for how the Web Map Server (WMS 1.0 & 1.1 & 1.3) specification can be extended to allow user-defined symbolization of feature data.
Open GIS ® Web Coverage Service (WCS)	1.0	2003-10-16	Extends the Web Map Server (WMS) interface to allow access to geospatial "coverages" that represent values or properties of geographic locations, rather than WMS generated maps (pictures).
Open GIS ® Web Feature Service (WFS)	1.1	2005-05-03	The OGC Web Feature Service (WFS) interface is a collection of operations (implemented as messages carried over HTTP) for retrieving and manipulating geographic features. An implementation of the OGC WFS IS allows a client to retrieve and update geospatial data from one or more Web Feature Services.

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OGC Web Services - 4

Open GIS ® Web Map Context Documents (WMC)	1.1	2005-05-03	This document is a companion specification to the OGC Web Map Service Interface Implementation Specification The present Context specification states how a specific grouping of one or more maps from one or more map servers can be described in a portable, platform-independent format for storage in a repository or for transmission between clients.
Open GIS ® Web Map Service (WMS)	1.3	2004-08-02	Provides three operations protocols (GetCapabilities, GetMap, and GetFeatureInfo) in support of the creation and display of registered and superimposed map-like views of information that come simultaneously from multiple sources that are both remote and heterogeneous.
Open GIS ® Reference Model (ORM)	0.1.2	2003-03-04	The ORM describes a framework for the ongoing work of the OpenGIS Consortium and our specifications and implementing interoperable solutions and applications for geospatial services, data, and applications.

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Summary

- OGC leads the development of web based geospatial standards
- OGC approach is based on common architecture methods
- U.S. government and EU and others are defining ‘enterprise architectures’
  - OGC architecture fits into all of these
- Data and services will move interoperably around the world
  - Releasing dependence on individual vendors, data types and data formats
  - Easing insertion of new technologies and updating old ones
  - Protecting value of legacy data and systems

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