

Fire Validation Use Case

The scenario will demonstrate fire validation using various disparate Web map services connecting via an Internet-based distributed computing environment. Using disparate data and services, the application seamlessly integrates data access, visualization and discovery to satisfy goals of end users. In this scenario, the science goals are to validate forest fire burn area polygons using temporal satellite browse imagery as a validation query result layer. Further investigation in land cover information is performed upon burn area validation.

Using the abovementioned services, the application will demonstrate the integration of OGC distributed services within a science-based application.

Scenario

- Coarse validation of AVHRR-based fire detection, using Landsat 7 browse image services within the Canadian landmass. Assessment of burned areas, based on visualization and query of land cover and land use services

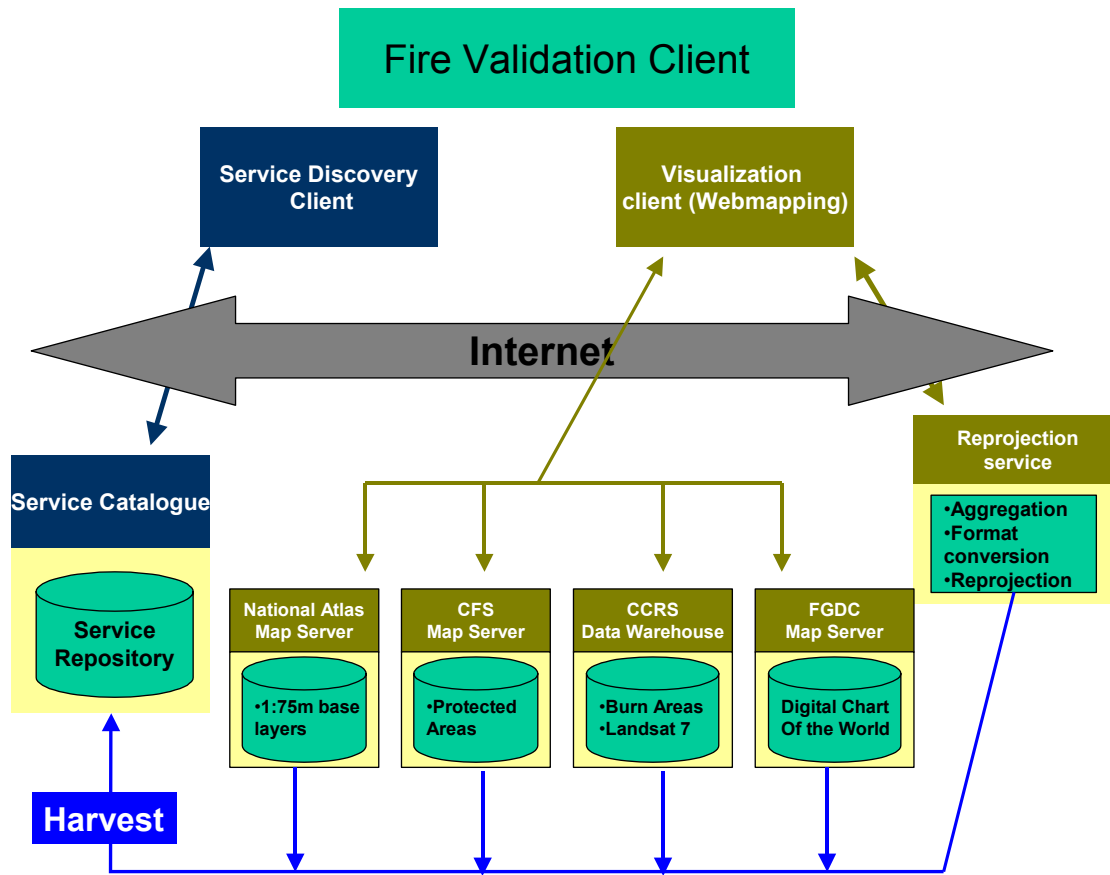
The scenario is as follows:

1. Using an Internet browser (e.g. Internet Explorer, Netscape Navigator), user enters the fire-mapping client. The client consists of a map viewer with some pre-selected framework layers available for display as well as an OGC web services catalog search form with date, geographic region, keyword and other search constraint fields.
2. The initial layer view contains layers from multiple WMS services:
 - an image base layer
 - Political Boundaries
 - Capital Cities
 - Burned Areas polygonsPre-selected other layers are available for inclusion in the view. The user can toggle and visualize layers on/off as desired and refresh the map view. Layers and data are retrieved through WMS "GetMap" requests.
3. The user zooms into a burn area polygon in Northern Manitoba where he/she adds Populated Places to the view. The user then begins to zoom, via bounding box selection, into a burn area polygon. The bounding box is automatically transferred to the search form.
4. The user queries the polygon (WMS "GetFeatureInfo") by selecting any part of the polygon with a mouse click, then clicks the "Query" button to receive start and end dates of the burn area, as well as other attribute data for the selected burn polygon. The temporal data can then be passed by mouse click to the search form of the fire-mapping application.
5. The user, wishing to discover Landsat 7 WMS layers, adds keywords "Landsat 7 browse" to the keyword field of the search form and submits a search to the Service Catalogue.

6. The Service Catalogue returns available WMS layers satisfying the search criteria (date, region). The user selects WMS browse layers for before and after the burn dates. The user clicks the “Transfer” button to add desired layers to the parent window layer visualization stack, toggles them on and off to validate the burn area recorded by Landsat 7 against the polygon generated by NOAA fire detection.
7. The user, looking for additional information pertaining to the study area, then queries the Service Catalogue using the constraint “features within 20km” and keywords “land cover”, “forest cover” and “protected area”.
8. The user finds “Protected Areas-Manitoba” as an acceptable WMS layer to add to their application and toggles it on. The user imports the layer into the layer visualization stack, selects to view it, then refreshes the view.
9. The user then clicks on a Protected Area polygon, to query the layer, discovering existence of Wapusk National Park. The user queries another polygon, and discovers Numaykoos Lake Provincial Park. Both polygons intersect burn areas in the study area.
10. The user finds “EcoRegions” as an acceptable WFS layer to add to their application from the previous query results. The user imports the layer into the layer visualization stack, selects to view it, then refreshes the view. The WFS returns GML which is rendered into graphics in the client
11. The user queries EcoRegions polygons to discover other attributes of the study area
12. End of main demo

Credits:

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Architecture

Data Stores

- National Forest Information System (NFIS) -- Canadian Forest Service (CFS), Victoria, B.C.
 - Land Coverage Information – Landsat Worldwide Referencing System grid, Canadian Coverage
 - Ecozones – Environment Canada
 - Protected Areas – Natural Resources Government of Manitoba
- Geospatial Data Warehouse – CCRS/GeoAccess Division, Ottawa, Ont.
 - Burnt Forest within Canada for 1998 and 1999 derived NOAA / AVHRR (FireM3 - NRCan)
 - Landsat 7 ETM browse imagery, July / August 1999
- National Atlas – CCRS/GeoAccess Division, Ottawa, Ont.
 - 1:7 500 000 base data
 - Provinces and Territories
 - Regions Outside Canada
 - Drainage
 - Water Areas
 - Road Networks
 - International Boundaries
 - Populated Places
 - Capital Cities