



GeoPrisma

Boreal Information Strategies Inc.
Mapgears Inc.

GeoSpatial data over the Web

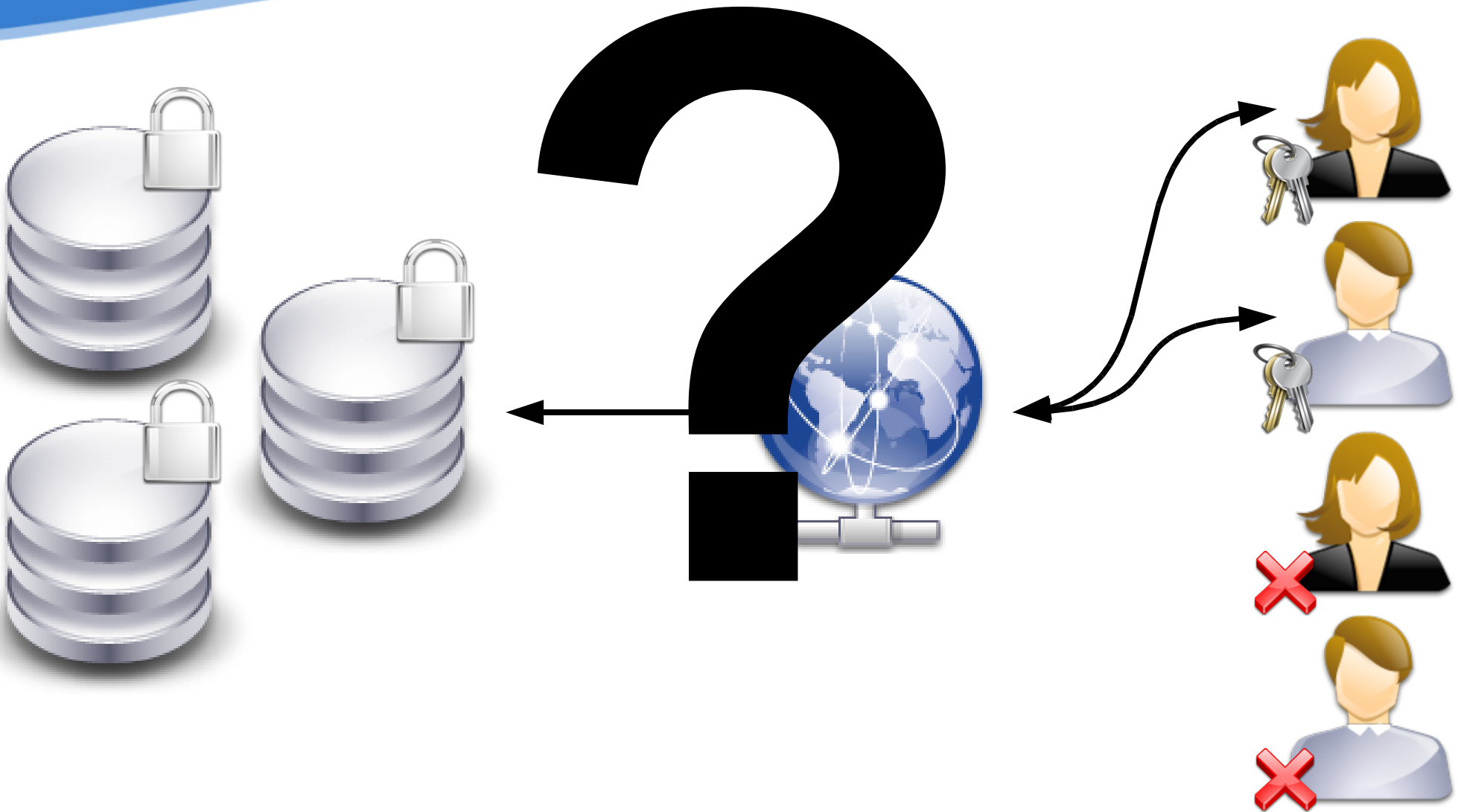


GeoSpatial data



Web

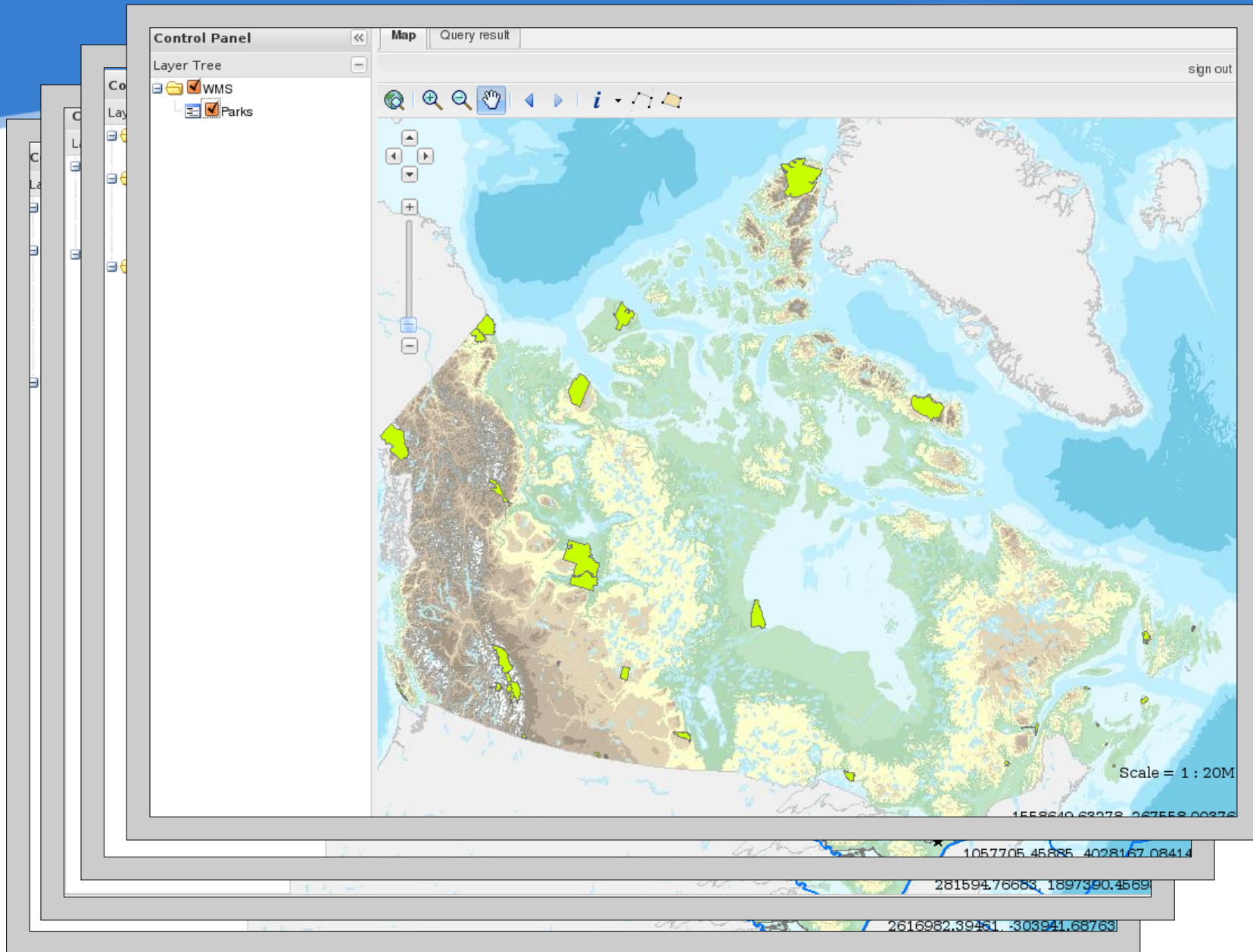
Need : access control



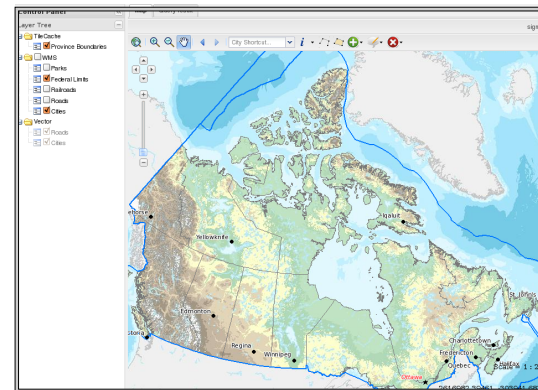
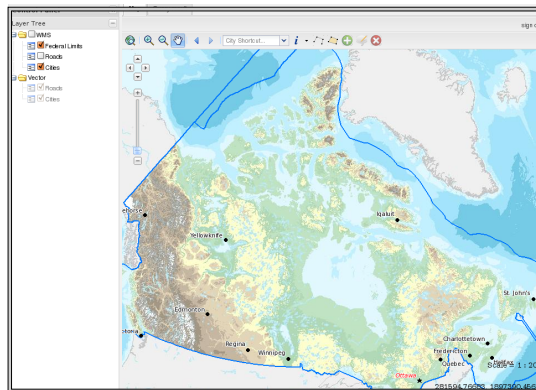
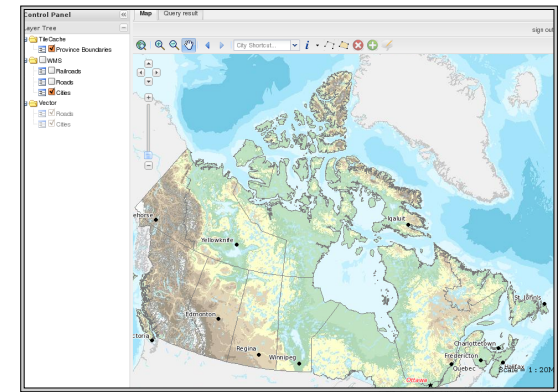
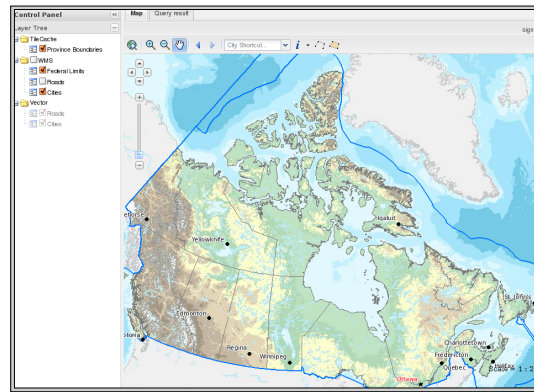
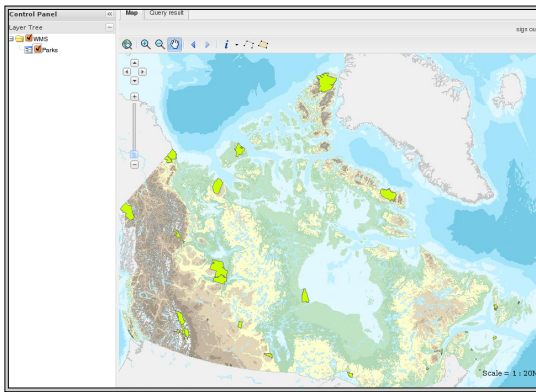
Sample : GMap



Several single applications



x applications = hard to maintain



Solution

GeoPrisma

A web mapping application featuring access control to geospatial data with dynamic user interfaces.

GeoPrisma features

Built on OpenSource libraries

Architecture

Access controlled data (proxy)

Integration with any authentication libraries

Integration with any geospatial services

Links to external applications

Dynamic User Interface (UI)

Custom template

i18n support

Access controlled functionality (widgets)

Built on OpenSource libraries

OpenLayers

MapFish

GeoExt

ExtJS

FeatureServer

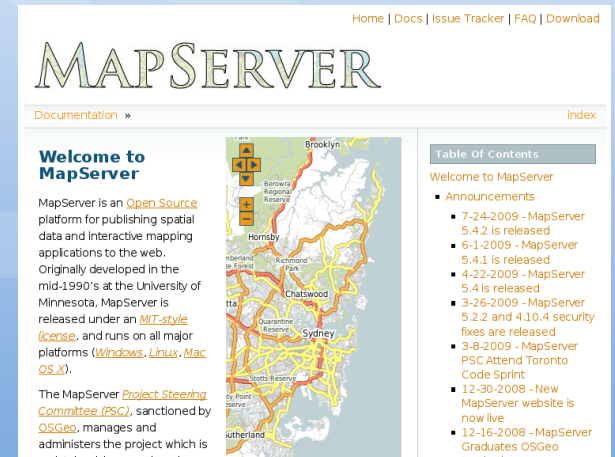
MapServer

TileCache

etc.



The screenshot shows the OpenLayers website. At the top, there is a navigation menu with links for Home, Gallery, Support & Development, Sponsorship, Wiki, Blog, FAQ, Download, and Email Lists. The main content area features a large satellite map of the world with a blue location pin over the North Atlantic. To the left of the map, there is a section titled "OpenLayers: Free Maps for the Web" with a sub-section "Get OpenLayers Now!!" and "Latest code:" followed by a list of links: "Link to the hosted version", "2.8 (Stable): .tar.gz | .zip", "2.8 Release Notes", "Class Documentation, More documentation", "See Screenshots", and "See examples of OpenLayers Usage". Below this is an "About..." section. To the right of the map, there is a text box that says "Put an open map widget in any web page!" and "Double-click to zoom in, and drag to pan. Hold down the shift key and drag to zoom to a particular region."



The screenshot shows the MapServer website. At the top, there is a navigation menu with links for Home, Docs, Issue Tracker, FAQ, and Download. The main content area features the "MAPSERVER" logo in a stylized font. Below the logo, there is a "Documentation" section with a "Welcome to MapServer" heading. To the right of the text, there is a map of the Sydney region with various locations labeled. Below the map, there is a "Table Of Contents" section with a "Welcome to MapServer" heading and a list of announcements: "7-24-2009 - MapServer 5.4.2 is released", "6-1-2009 - MapServer 5.4.1 is released", "4-22-2009 - MapServer 5.4 is released", "3-26-2009 - MapServer 5.2.2 and 4.10.4 security fixes are released", "3-8-2009 - MapServer PSC Attend Toronto Code Sprint", "12-30-2008 - New MapServer website is now live", and "12-16-2008 - MapServer Graduates OSGeo".



The screenshot shows the GeoExt website. At the top, there is a navigation menu with links for Documentation, Examples, Download, and Development. The main content area features the "GeoExt" logo and a search bar. Below the logo, there is a "JavaScript Toolkit for Rich Web Mapping Applications" section with a sub-section "Using GeoExt" and a code snippet:

```
new Ext.Window({
  title: "GeoExt in Action",
  height: 200, width: 450, layout: "fit",
  items: [{
    xtype: "gx_mappanel",
    layers: [new OpenLayers.Layer.WMS(
      "Global Imagery", "http://demo.opengeo.org/geoserver/
    )]
  }],
  zoom: 1
})
}.show();
```

 To the right of the code, there is a "Download" section with "Current release: 0.5" and a "GeoExt News" section with "GeoExt at FOSS4G 2009" and "GeoExt 0.5 released".



The screenshot shows the MapFish website. At the top, there is a navigation menu with links for Wiki, Timeline, Roadmap, Browse Source, View Tickets, and Search. The main content area features the "mapfish" logo and a search bar. Below the logo, there is a "Find your way" section with a list of links: "Download and Install", "MapFish Applications", "Documentation", "Blog", "Follow me on Twitter", and "API Doc". Below this, there is a "MapFish" section with "MapFish is an easy-to-use and extensible web 2.0 mapping application framework." and "MapFish is composed of two parts: MapFish Client and MapFish Server. MapFish Client is a JavaScript framework based on OpenLayers for the mapping part, on ExtJS and GeoExt for the GUI part. MapFish Server is responsible for server side treatments and is composed of several modules which can be implemented in several languages such as Python, Java, Ruby, PHP or others." and "MapFish is cartographic server agnostic. It can be used with MapServer, GeoServer, MapGuide or whatever cartographic server that is able to communicate with open protocols like WMS or WFS."

Under the hood



WMS

TileCache

FeatureServer


MapFishServer

WPS

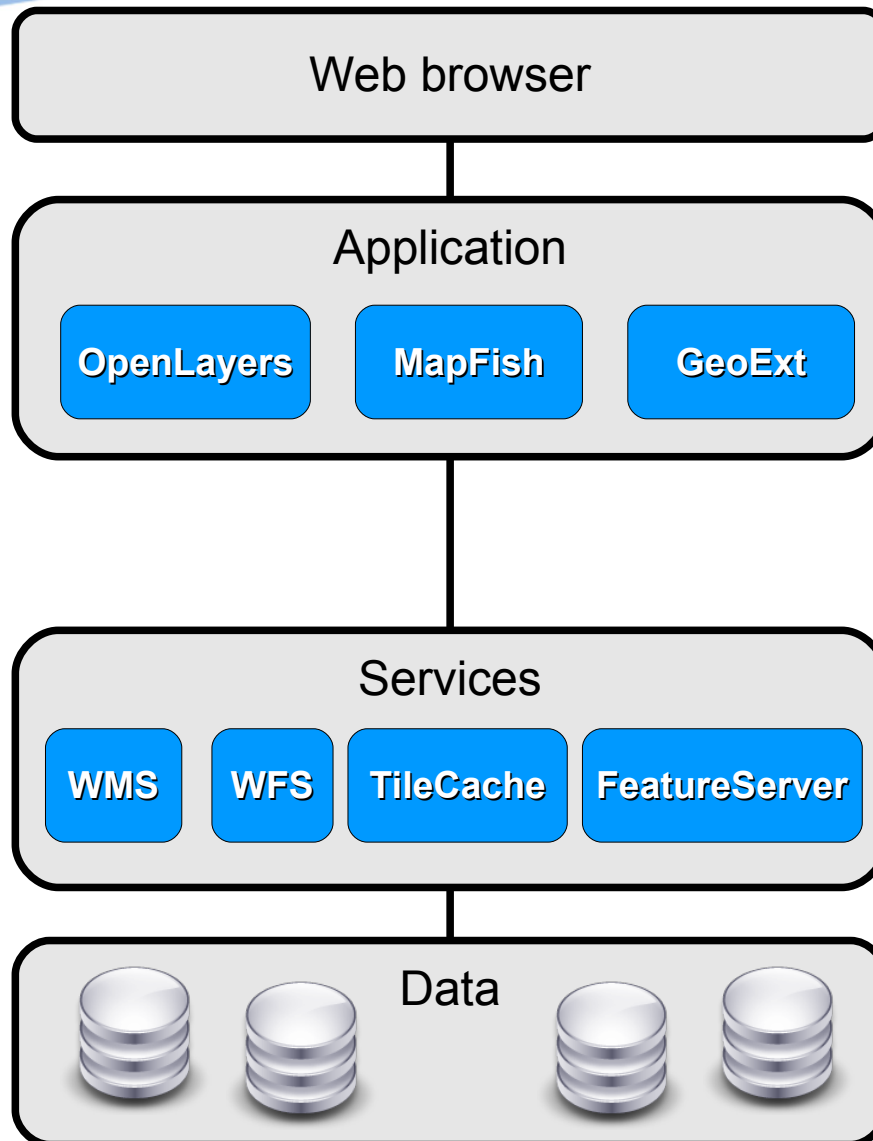
```
<service>  
  <source>http://featureserver.org/  
</service>
```

```
<datastore>  
  <layer>scribble</layer>  
</datastore>
```

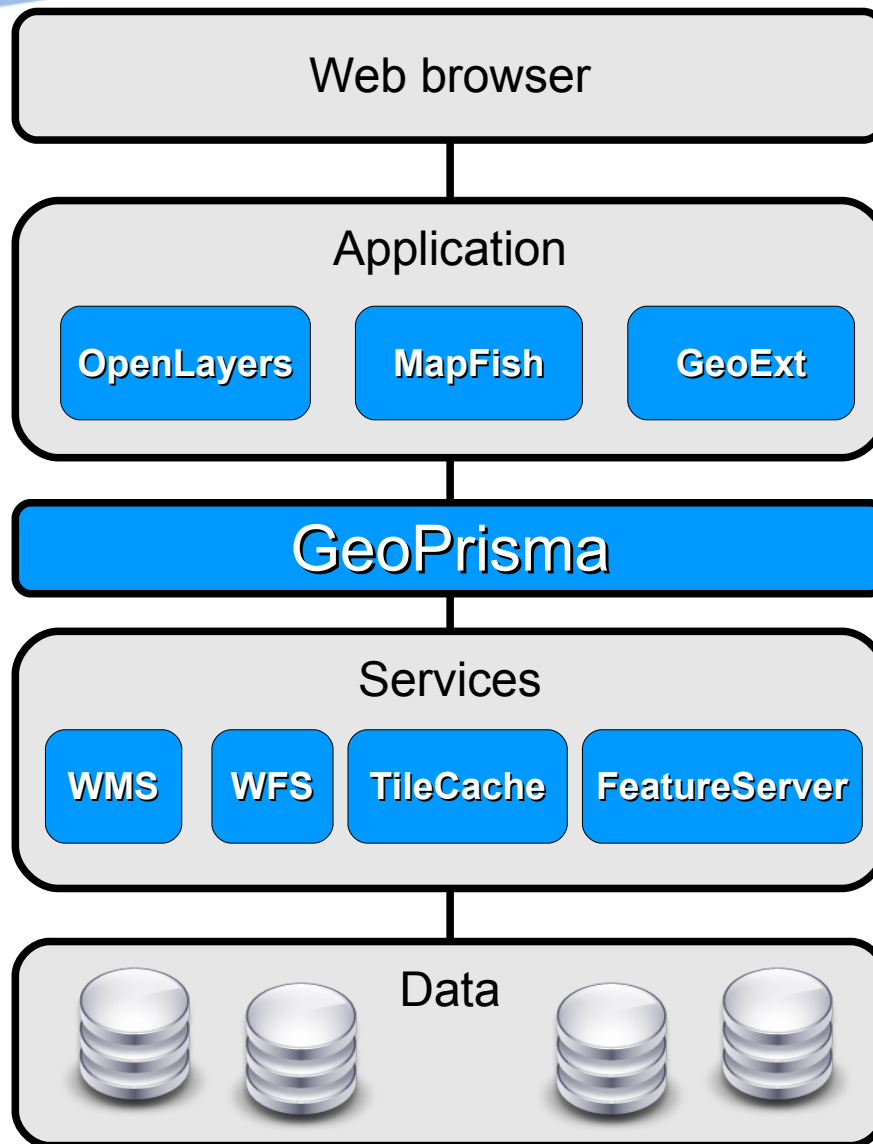
```
<resource>  
  <datastore>  
    <datastore>Scribble FS</datastore>  
    <datastore>Scribble TileCache</datastore>  
    <datastore>Scribble WMS</datastore>  
  </datastore>  
</resource>
```



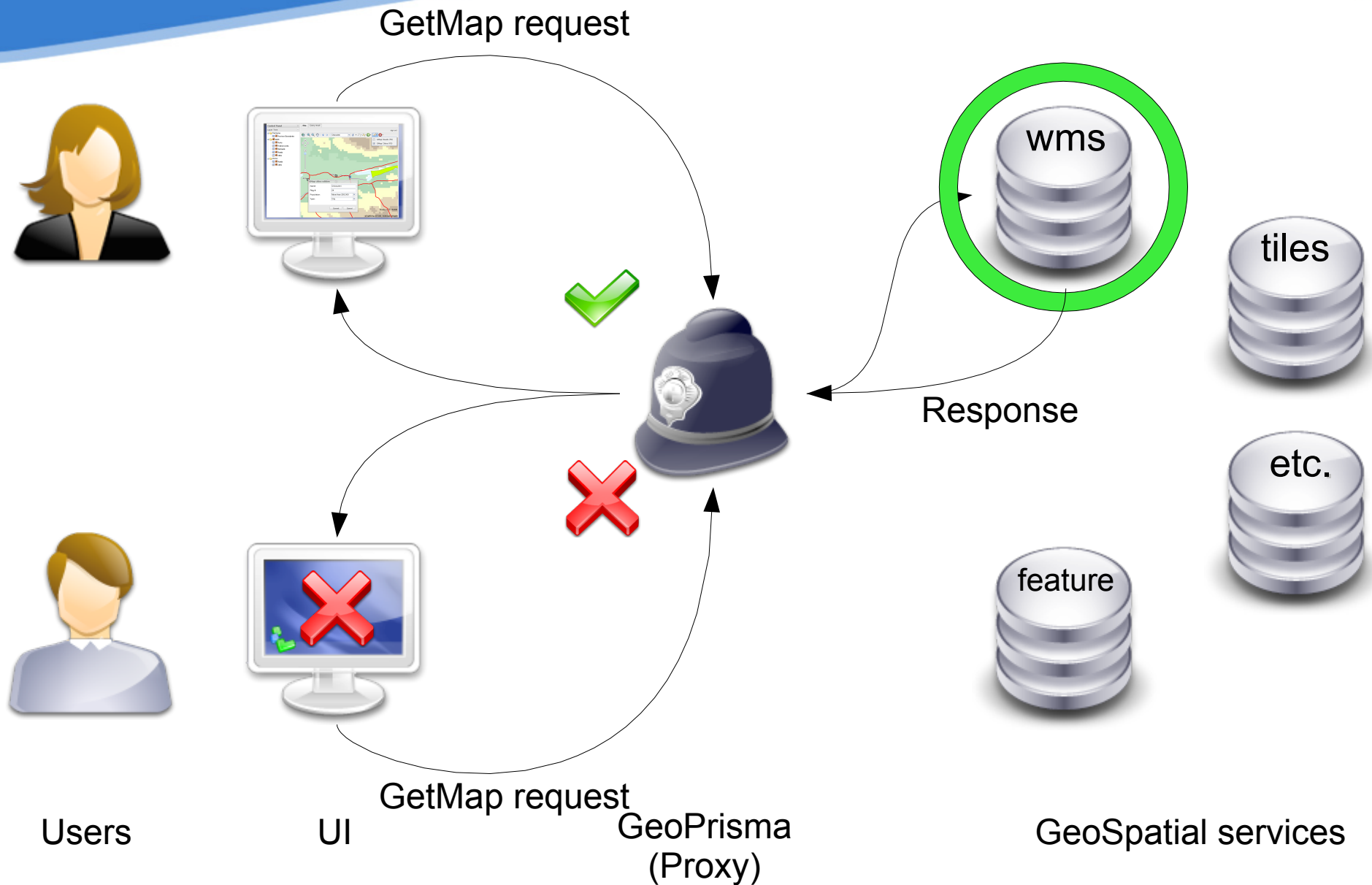
Standard architecture



Architecture with GeoPrisma



Access control by a proxy



Proxy

Components



Authentication
Access control list
Data filtering

Proxy

Integration with any
authentication libraries



LDAP
JOSSO
DataBase
XML
Yours...

```
class org_geoprisma_acl_BorealisACL extends org_geoprisma_acl_ACL
{
    private static $$s_objInstance = null;
    private static $$s_strUsername = 'anonymous';
    private static $$s_bCaching      = false;
```

Proxy

Integration with any
geospatial service



WMS
FeatureServer
TileCache
GYMO
Any...

```
abstract class org_geoprisma_service_Service
```

```
...
```

```
class org_geoprisma_service_FeatureServerService extends  
    org_geoprisma_service_Service
```

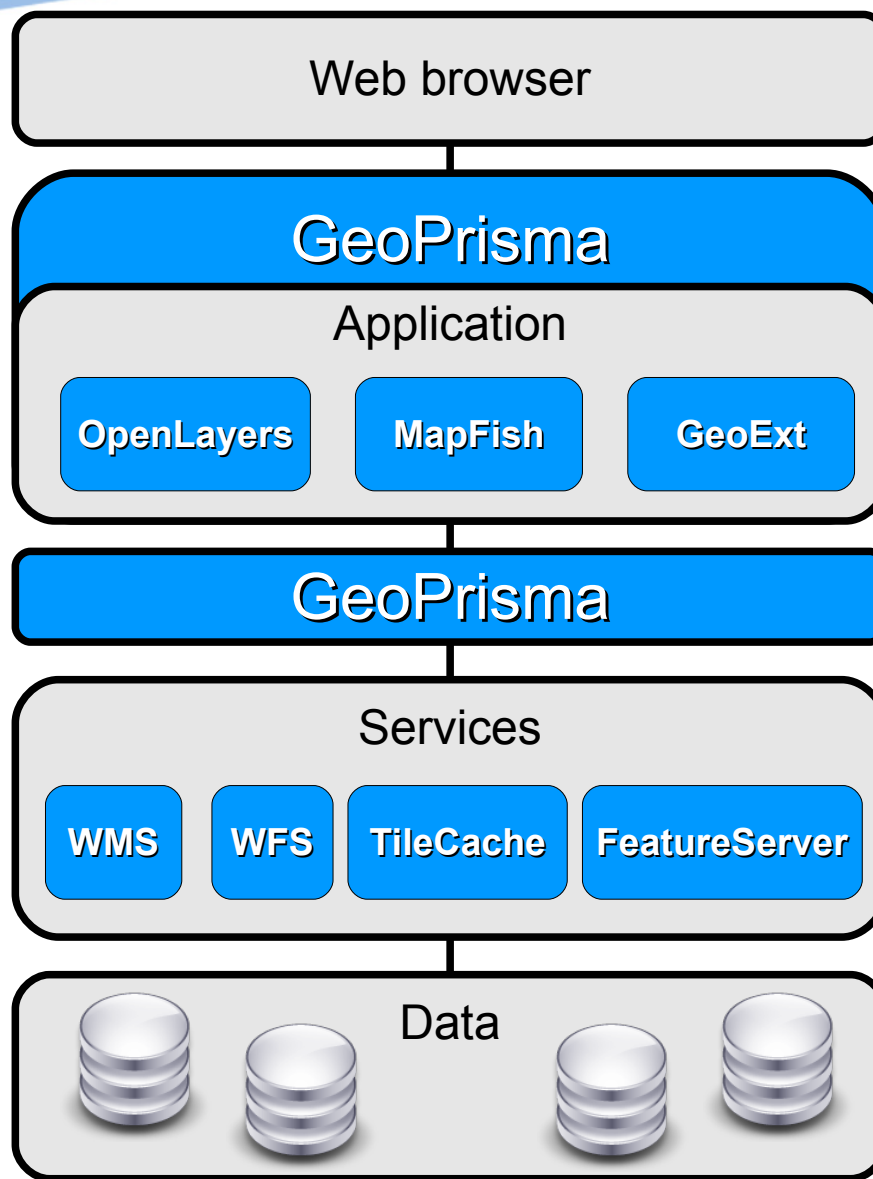

Proxy

Links to external applications



Your application !

Architecture with GeoPrisma



Dynamic User Interface

Custom UI templates

The image displays two screenshots of a web-based GIS application interface, illustrating a dynamic user interface with custom UI templates.

The left screenshot shows a map of Canada with a 'Control Panel' on the left and a 'Map' window on the right. The 'Control Panel' includes a 'Layer Tree' with the following layers:

- Tile Cache
- Province Boundaries
- WMS
- Parks
- Federal Limits
- Railroads
- Roads
- Cities
- Vector
- Roads
- Cities

The 'Map' window shows a map of Canada with a 'City Shortcut...' dropdown menu and a 'sign out' button. The map displays various geographical features, including cities like Iqaluit, Regina, Winnipeg, Ottawa, Fredericton, Quebec, St. John's, and Halifax. The scale is 1:20M.

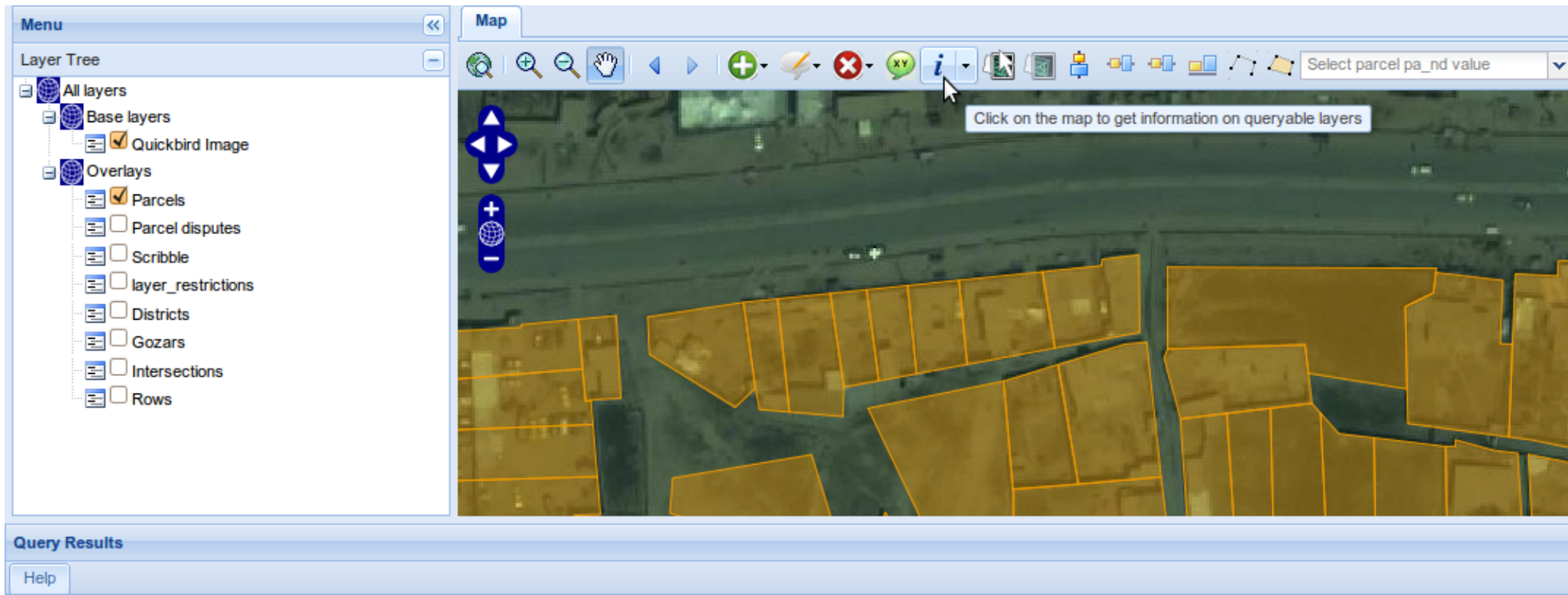
The right screenshot shows a zoomed-in view of the map with a 'Query Result' table at the bottom. The table displays the following data:

Name	Reg #	Population range (code)	Capital (code)
Jonquiere	24	5	0
Dorval	2	1	0

Dynamic User Interface

i18n support

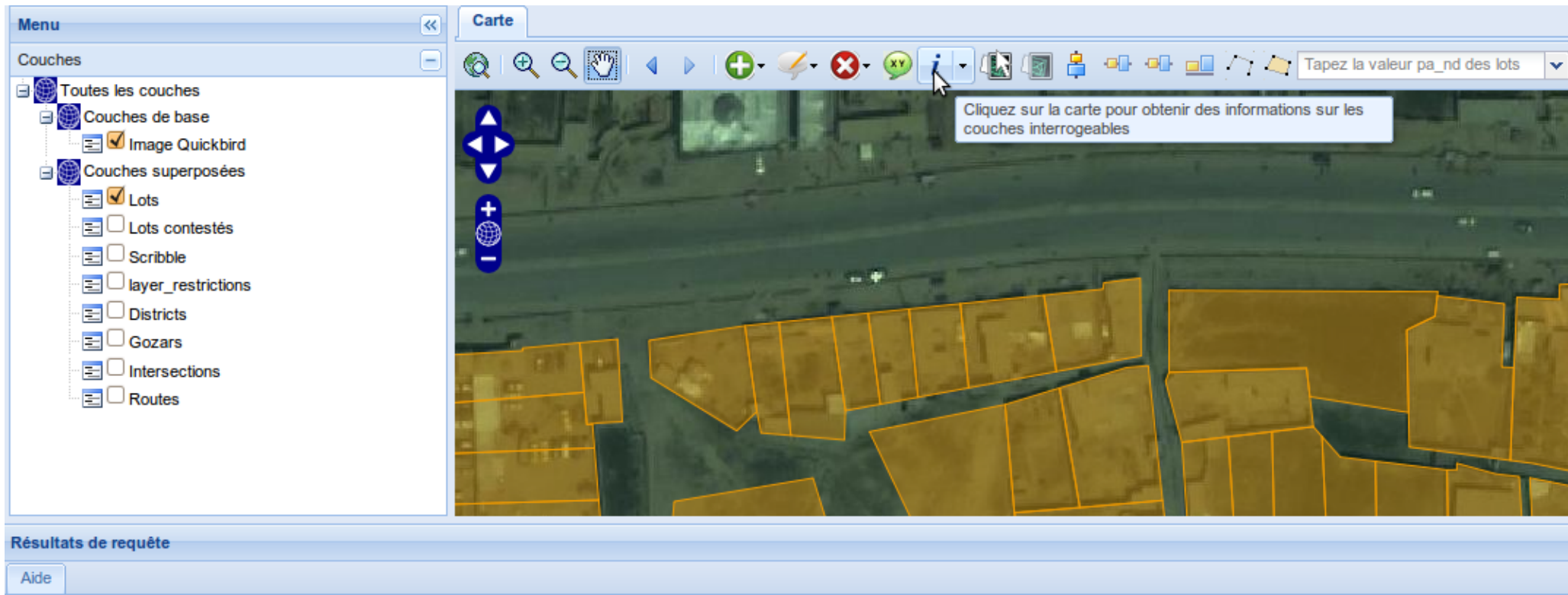
English



Dynamic User Interface

i18n support

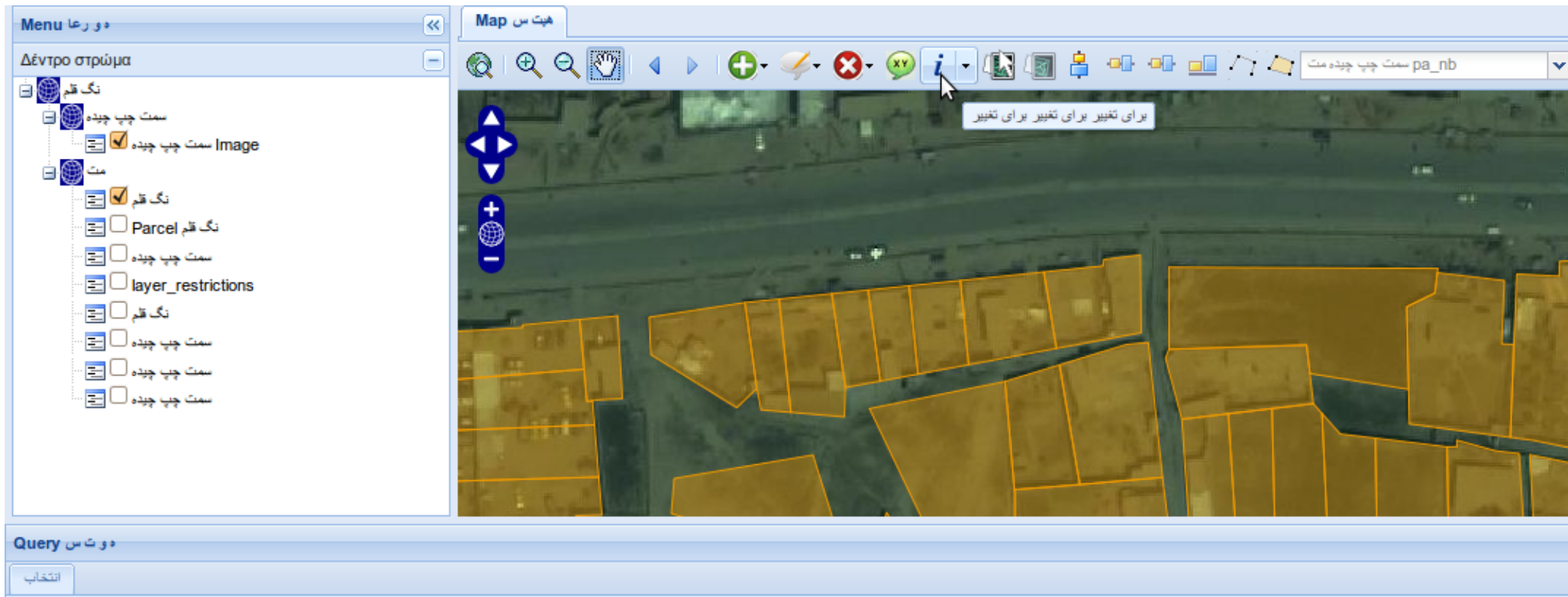
French



Dynamic User Interface

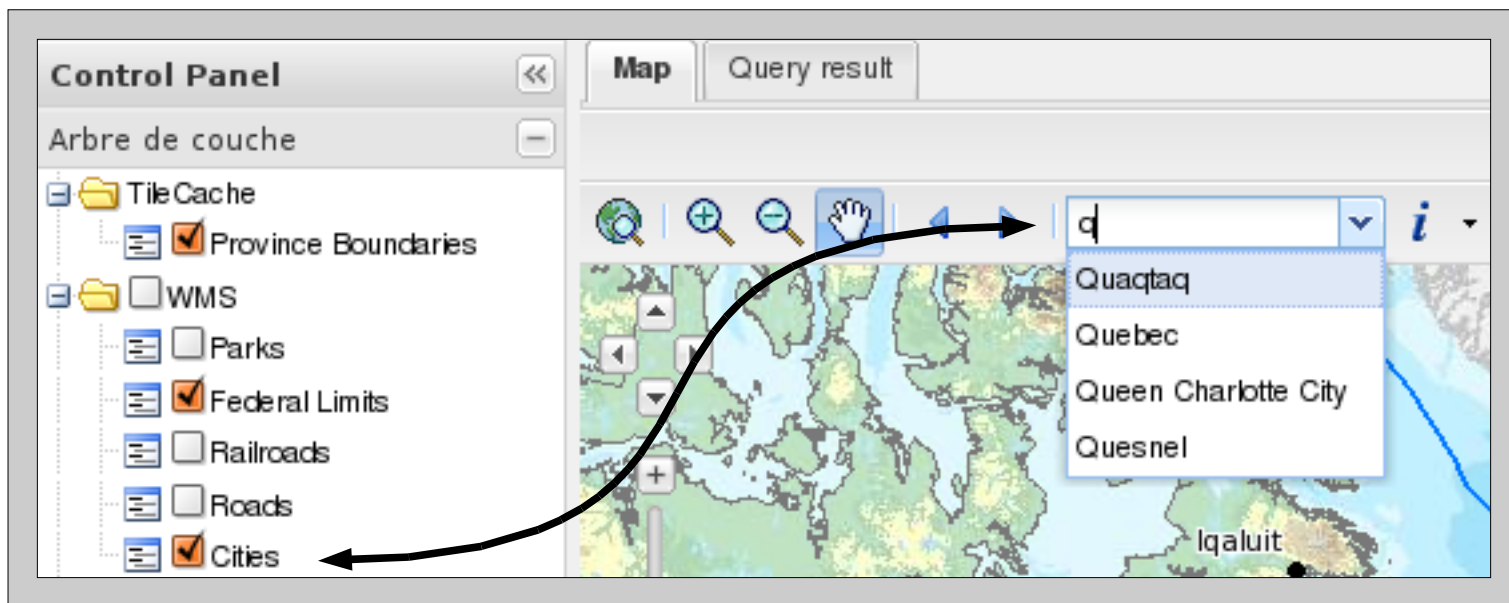
i18n support

Non roman languages



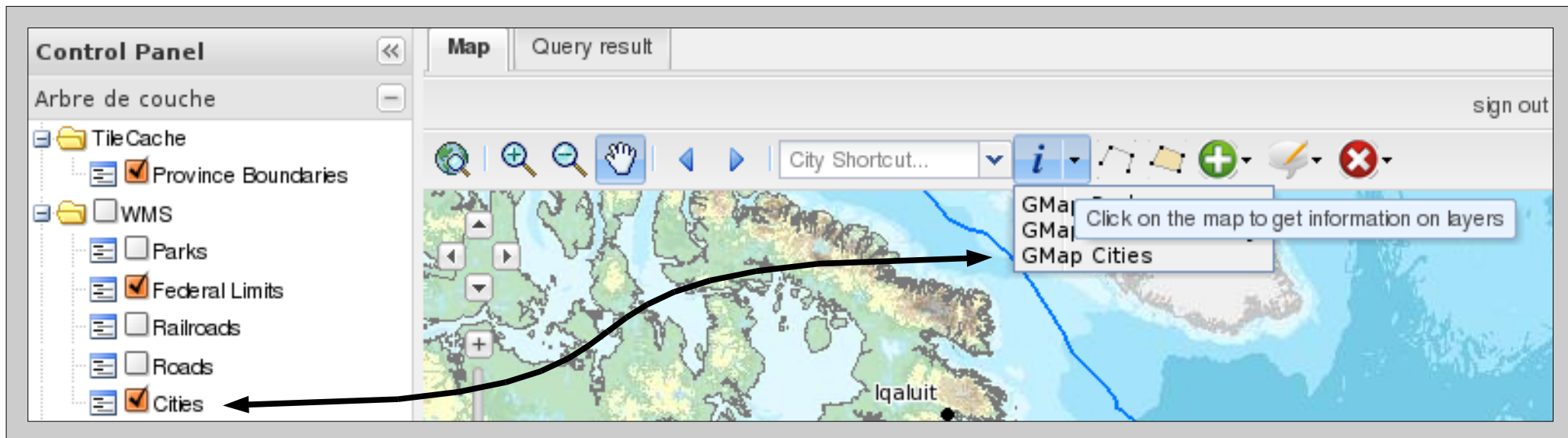
Dynamic User Interface

Widgets automatically
added if access granted



Dynamic User Interface

Widgets automatically
added if access granted



Dynamic User Interface

Widgets

Built with OpenLayers, MapFish, GeoExt, ExtJS, etc.

Map

MapPanel

Toolbar

ZoomSlider

Query

FeaturePanel

Editing tools

InitialView

Merge

Split

Scale

MousePosition

MeasureTool

LayerTree

Recenter

...

Control Panel



Map

Query result

Layer Tree



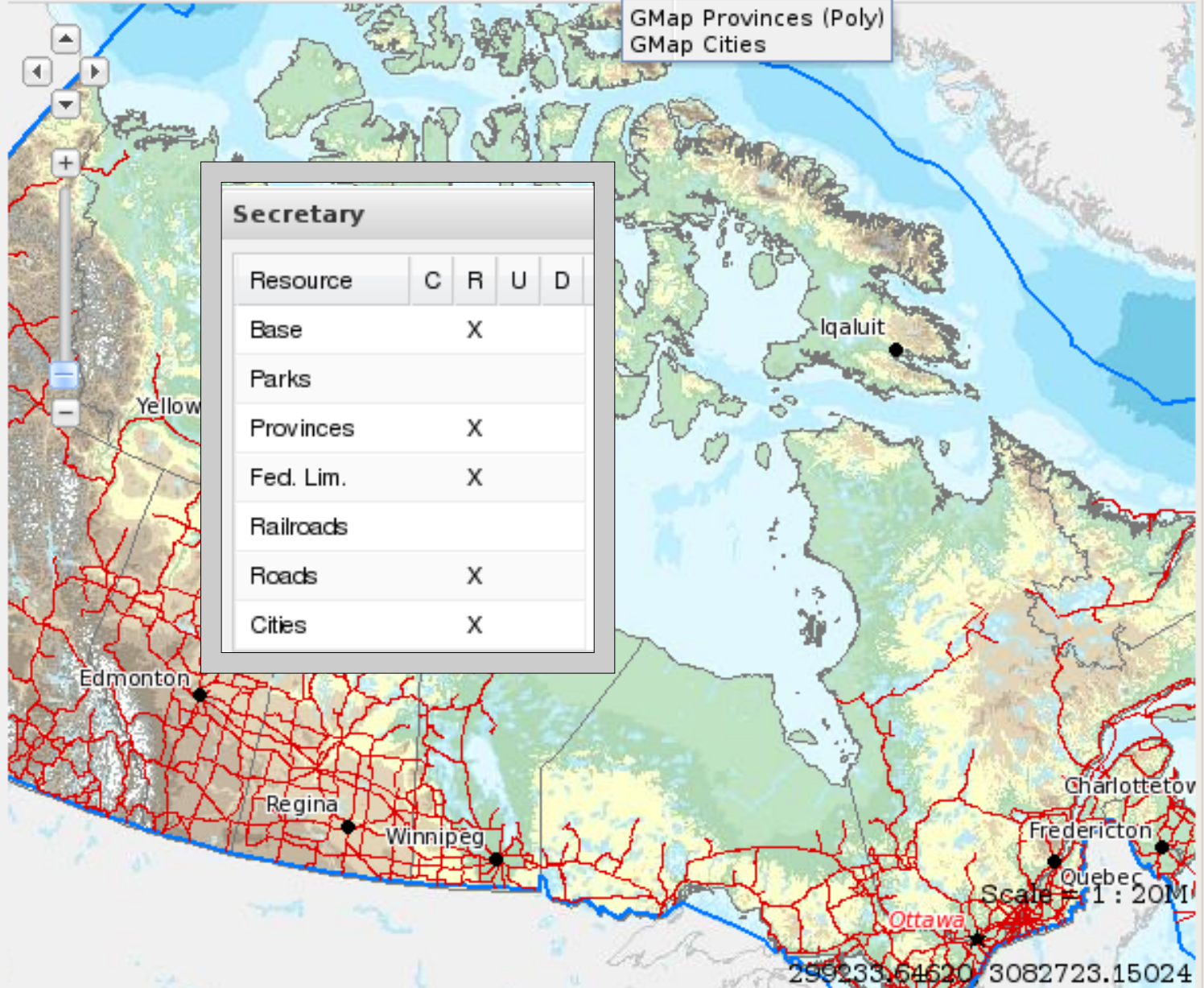
- TileCache
 - Province Boundaries
- WMS
 - Federal Limits
 - Roads
 - Cities
- Vector
 - Roads
 - Cities

sign out

Map navigation toolbar including zoom in, zoom out, pan, and a dropdown menu showing "City Shortcut..."

GMap Provinces (Poly)
GMap Cities

Secretary				
Resource	C	R	U	D
Base		X		
Parks				
Provinces		X		
Fed. Lim.		X		
Railroads				
Roads		X		
Cities		X		



259233.64620 3082723.15024

Control Panel



Map

Query result

Layer Tree

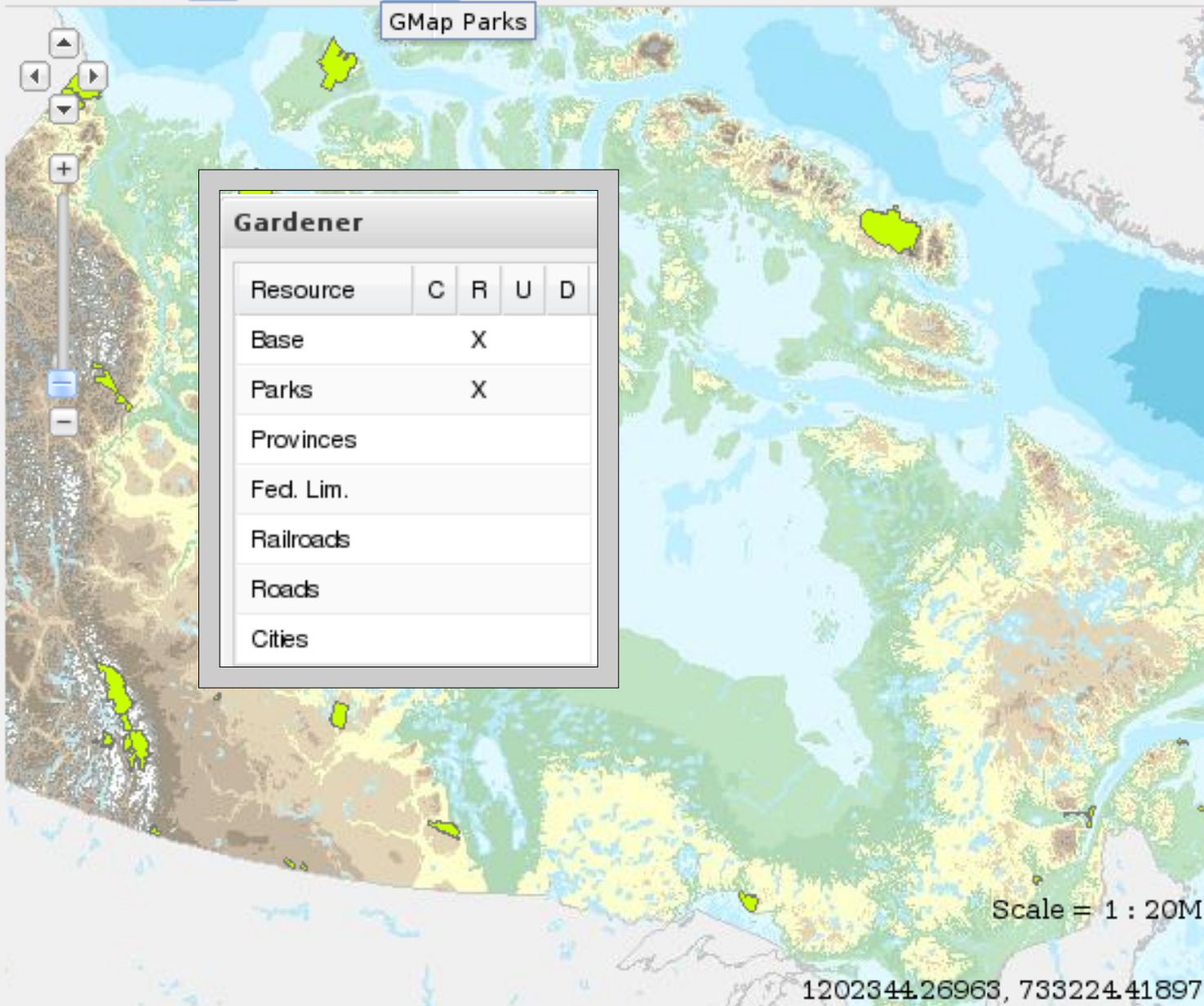


- WMS
- Parks

sign out



GMap Parks



Gardener				
Resource	C	R	U	D
Base		X		
Parks		X		
Provinces				
Fed. Lim.				
Railroads				
Roads				
Cities				

Scale = 1 : 20M

1202344.26963, 733224.41897

Control Panel



Map

Query result

sign out

Layer Tree

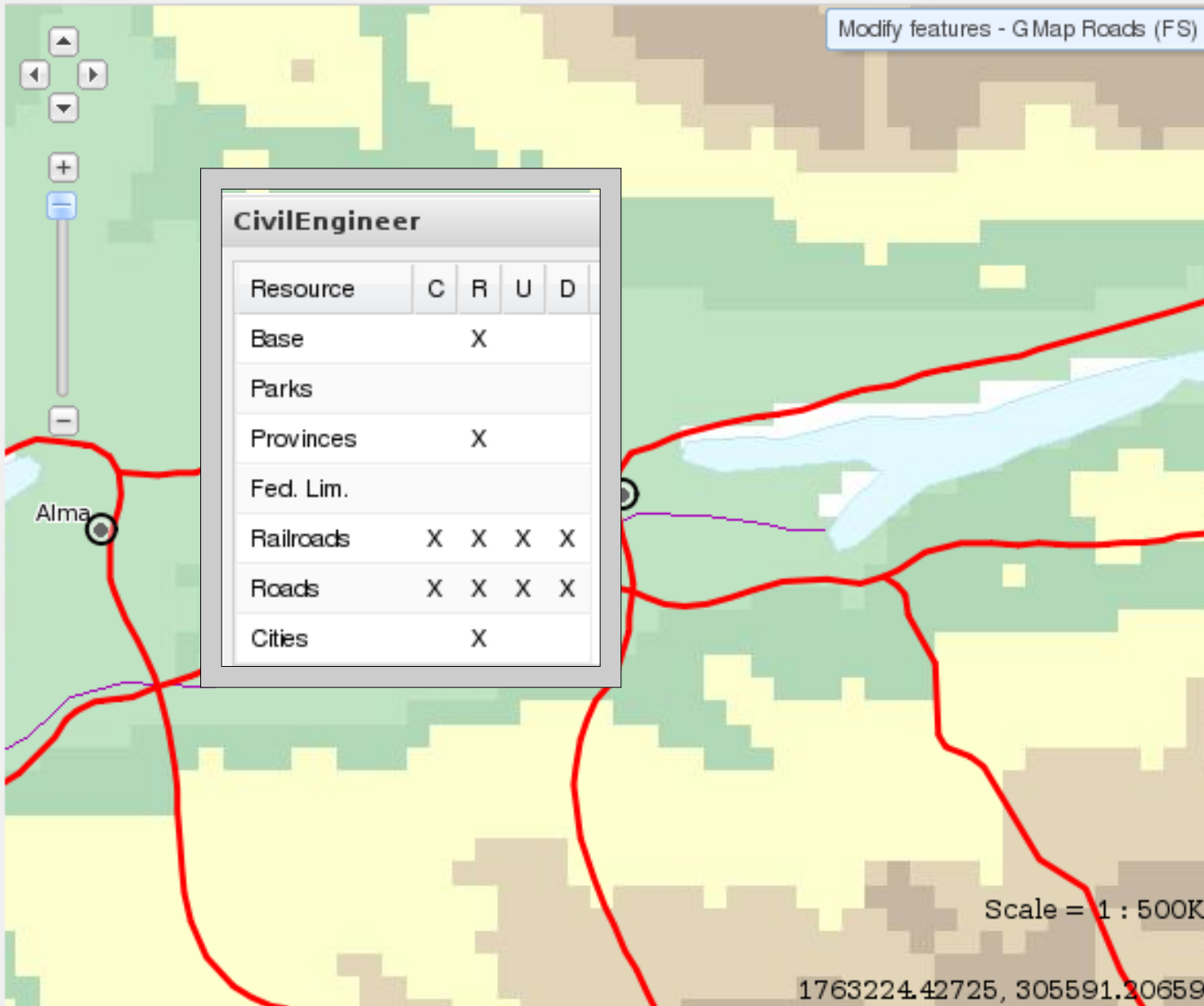


- File Cache
 - Province Boundaries
- WMS
 - Railroads
 - Roads
 - Cities
- Vector
 - Roads
 - Cities

Map navigation toolbar including icons for home, zoom in, zoom out, pan, and a search bar containing the text "Chicoutimi".

Modify features - G Map Roads (FS)

CivilEngineer				
Resource	C	R	U	D
Base		X		
Parks				
Provinces		X		
Fed. Lim.				
Railroads	X	X	X	X
Roads	X	X	X	X
Cities		X		



Control Panel << Map Query result

Layer Tree - sign out

- WMS
 - Federal Limits
 - Roads
 - Cities
- Vector
 - Roads
 - Cities

Chicoutimi

Modify features - GMap Cities (FS)

Alma

Settler

Resource	C	R	U	D
Base		X		
Parks				
Provinces				
Fed. Lim.		X		
Railroads				
Roads		X		
Cities	X	X	X	X

Map cities edition

Name: Chicoutimi

Reg #: 24

Population: More than 250,000

Type: City

Commit Cancel

1746114,71427, 272959,27977

Control Panel << Map Query result

Layer Tree - sign out

- File Cache
 - Province Boundaries
- WMS
 - Parks
 - Federal Limits
 - Railroads
 - Roads
 - Cities
- Vector
 - Roads
 - Cities

Chicoutimi

GMap Roads (FS)
 GMap Cities (FS)

SuperAdmin

Resource	C	R	U	D
Base	X	X	X	X
Parks	X	X	X	X
Provinces	X	X	X	X
Fed. Lim.	X	X	X	X
Railroads	X	X	X	X
Roads	X	X	X	X
Cities	X	X	X	X

Name:

Reg #:

Population:

Type:

Commit Cancel

Alma

Scale = 1 : 500K

1748584.15738, 305943.98418

Contributors

Boreal Information Strategies Inc.
Mapgears Inc.
Nippour Geomatik

Conclusion

We want your feedback !

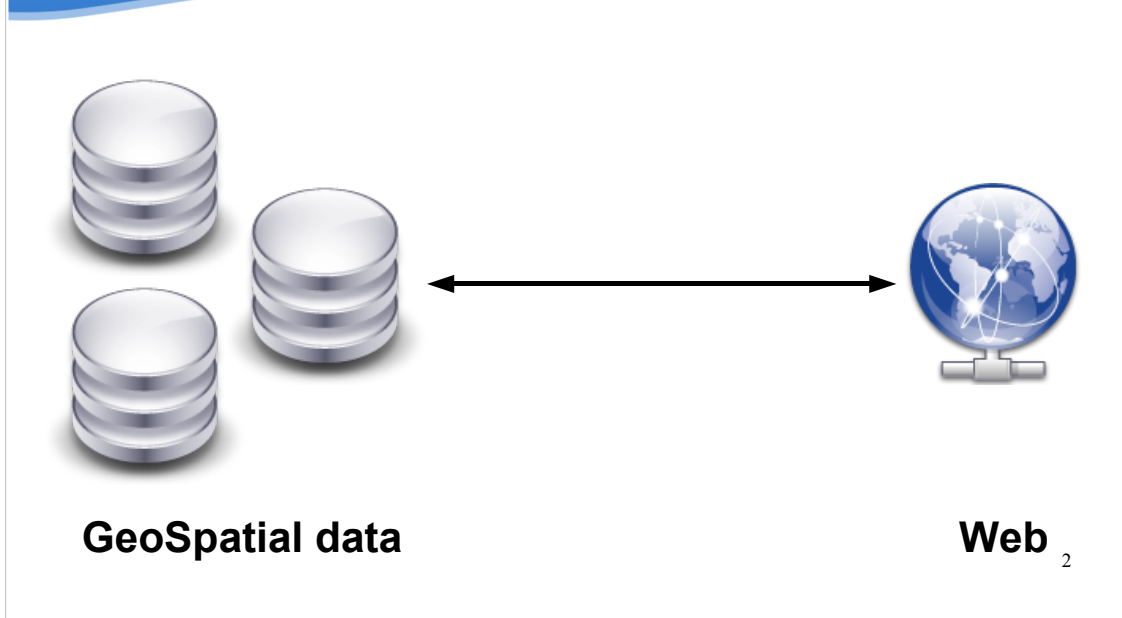
<http://geoprisma.org/download>



Borealis

MapGears

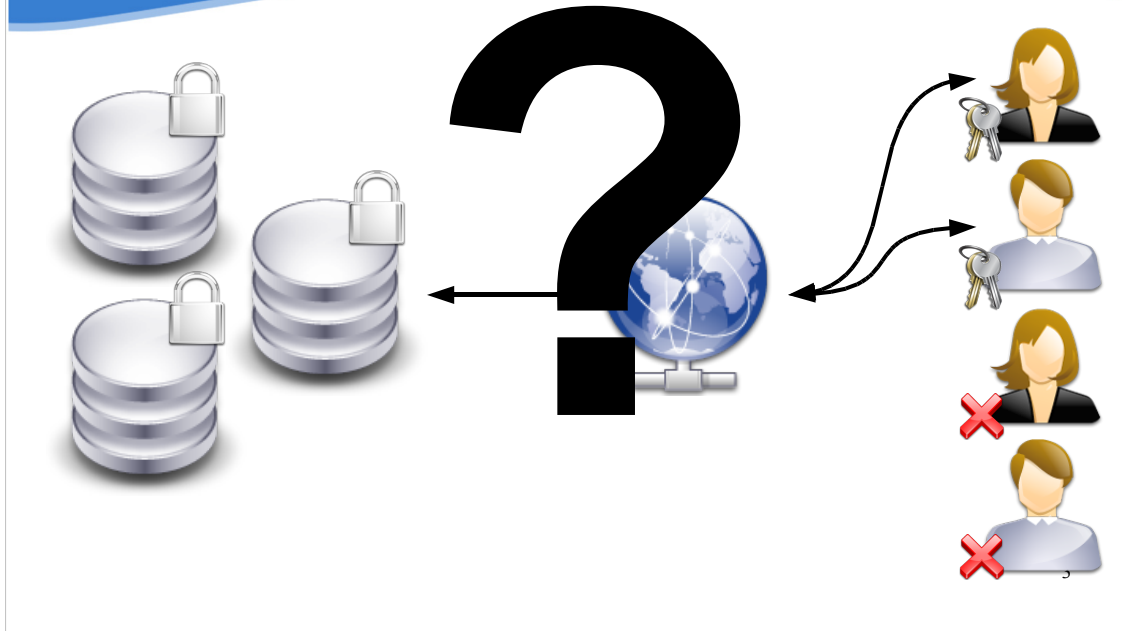
GeoSpatial data over the Web



A common problem today is to bring geospatial data over the web.

This has been solved already in the past; we won't bore you with that.

Need : access control



But what about access control ?

What if you want to bring your data over to the web, but not to everyone?

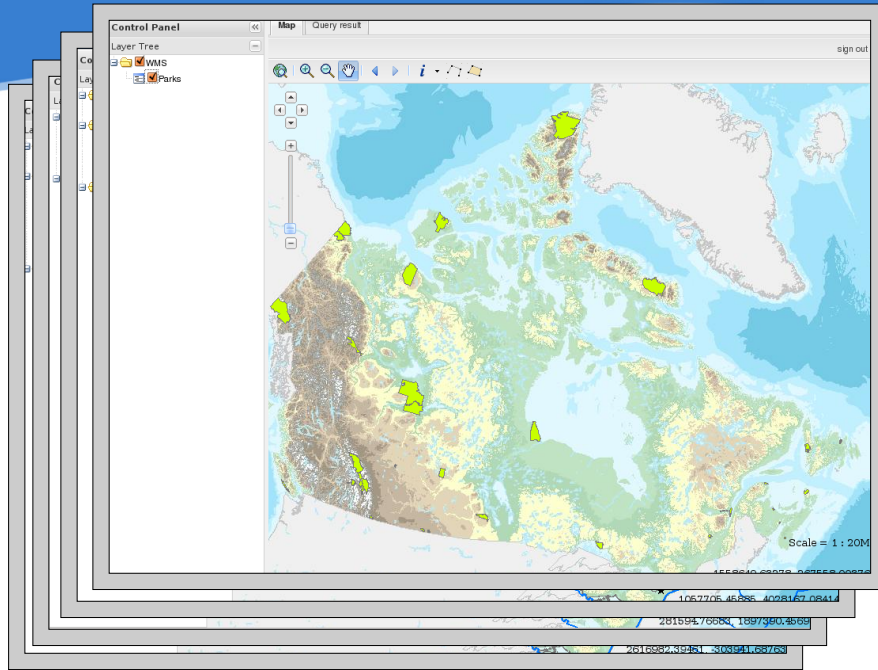
Sample : GMap



The easiest way to demonstrate the need is with an example.

Here's the Gmap demo. Let's apply some access control to it.

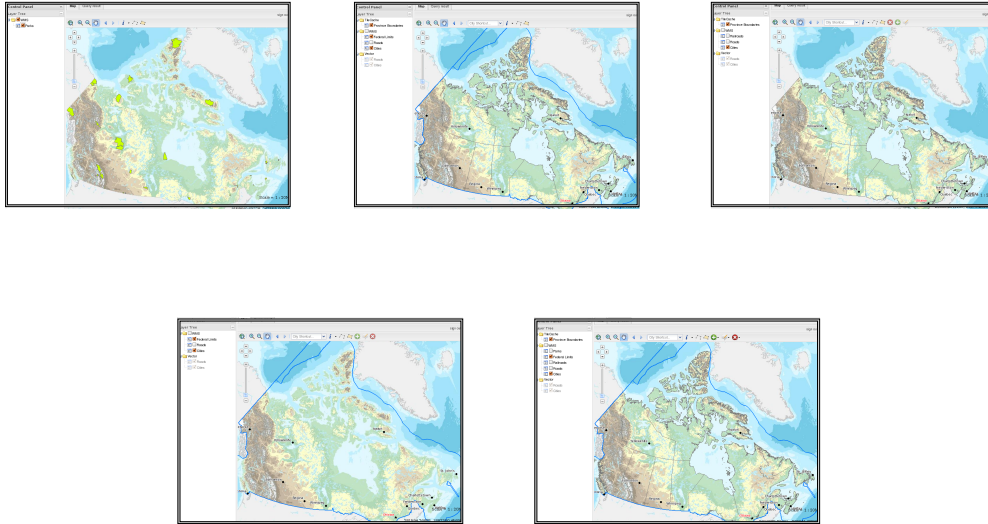
Several single applications



5

Without an access control tool, you would have to create several individual applications and apply security to each one.

x applications = hard to maintain



6

Several applications to maintain is counterproductive.

Solution

GeoPrisma

A web mapping application featuring access control to geospatial data with dynamic user interfaces.

7

Our solution : GeoPrisma

A web mapping application featuring access control to geospatial data **and** dynamic user interfaces.

GeoPrisma features

Built on OpenSource libraries

Architecture

Access controlled data (proxy)

Integration with any authentication libraries

Integration with any geospatial services

Links to external applications

Dynamic User Interface (UI)

Custom template

i18n support

Access controlled functionality (widgets)

8

Now let's take a closer look at it.

There are 2 main features to GeoPrisma: a proxy and a dynamic UI.

But first let's present Geoprisma.

Built on OpenSource libraries

OpenLayers

MapFish

GeoExt

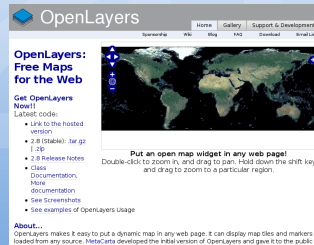
ExtJS

FeatureServer

MapServer

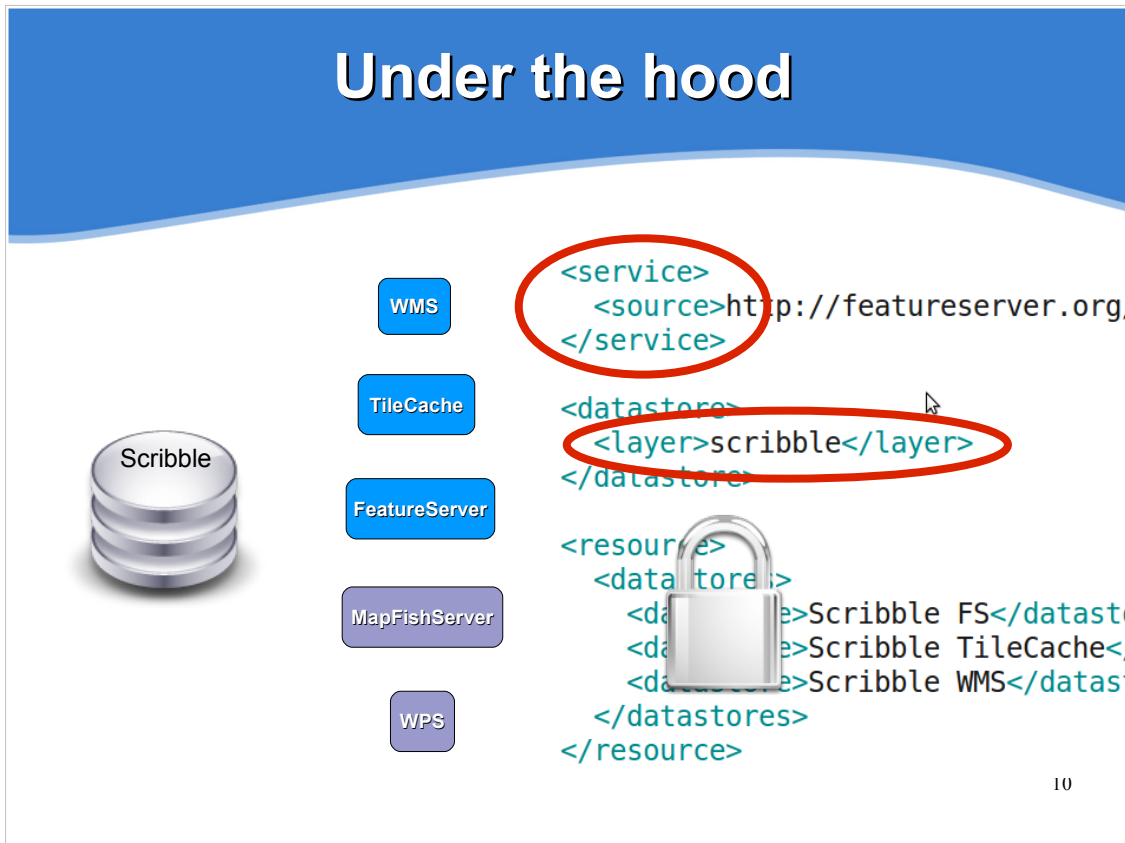
TileCache

etc.



First of all, GeoPrisma does not reinvent the wheel.

We use existing and proven Open Source components such as OpenLayers, MapServer, MapFish and others...



Under the hood the concept is quite simple. Access control on the data is configured in an XML file.

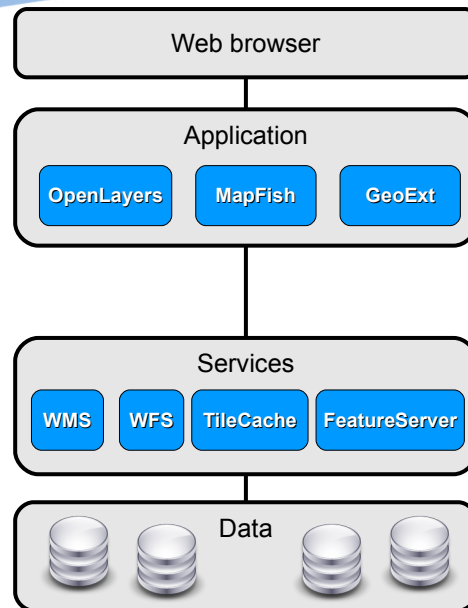
Multiple services can be defined, WMS, FeatureServer, TileCache and soon MapFishServer or WPS.

All those services can serve the same layer.

In GeoPrisma we regroup all those services under a component we call resource.

And it's on the resource that we apply access control.

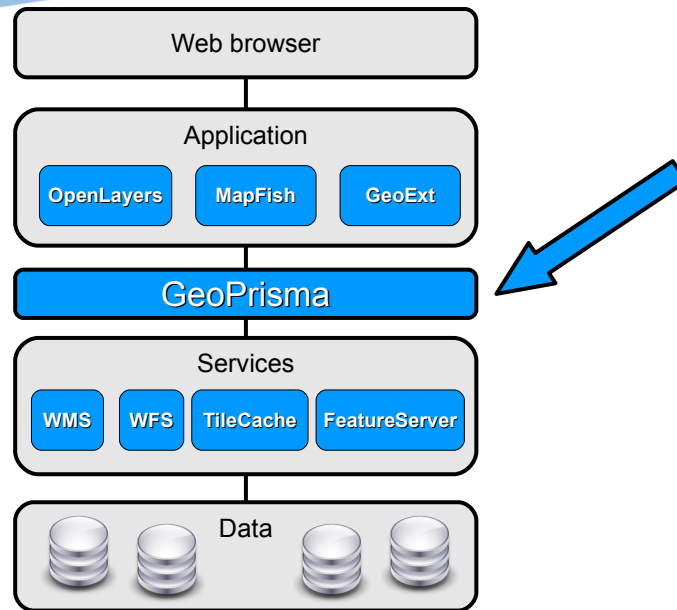
Standard architecture



11

To illustrate what we are saying, here's a typical web mapping architecture, composed of a client browser running JavaScript applications (like OpenLayers) connecting with services on a server (WMS, WFS, TileCache).

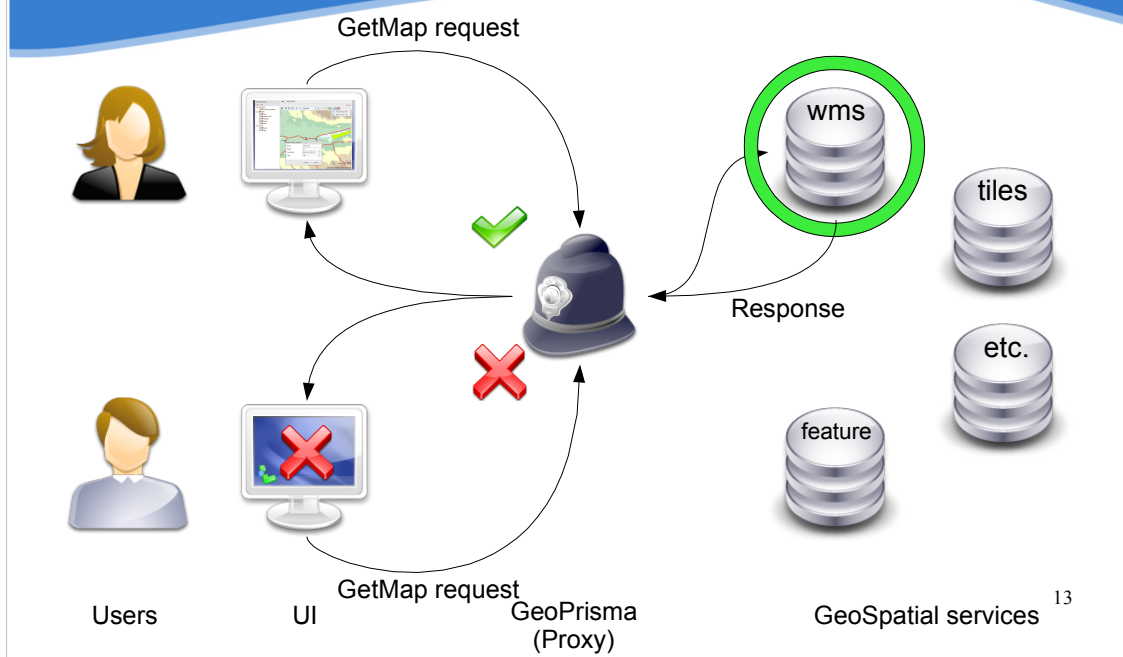
Architecture with GeoPrisma



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GeoPrisma provides an access control layer that fits in between the client and the services.

Access control by a proxy



Here's a simple example.

When a user tries to connect to a WMS service, GeoPrisma checks if she has access to it and sends the request to the server to get a map

If the user doesn't have access then the request is denied

Proxy

Components



Authentication
Access control list
Data filtering

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You may ask yourself: what's so special with GeoPrisma? I can do that in PHP or Python or whatever.

Sure, but our proxy can integrate with any authentication library and connect to any geospatial service.

Proxy

Integration with any
authentication libraries



LDAP
JOSSO
DataBase
XML
Yours...

```
class org_geoprisma_acl_BorealisACL extends org_geoprisma_acl_ACL
{
    private static $$_objInstance = null;
    private static $$_strUsername = 'anonymous';
    private static $$_bCaching    = false;
}
```

We currently have drivers to use LDAP, JOSSO, PostgreSQL DB, XML files for authentication.

And it's easy to make more : extend a PHP class !

Proxy

Integration with any
geospatial service



WMS
FeatureServer
TileCache
GYMO
Any...

```
abstract class org_geoprisma_service_Service
```

```
...  
class org_geoprisma_service_FeatureServerService extends  
org_geoprisma_service_Service
```

Arbitrary services can be configured to work with
GeoPrisma, not just OGC web services

You can see the list of currently supported services
and ...

It's easy to make more : extend a PHP class !.

Proxy

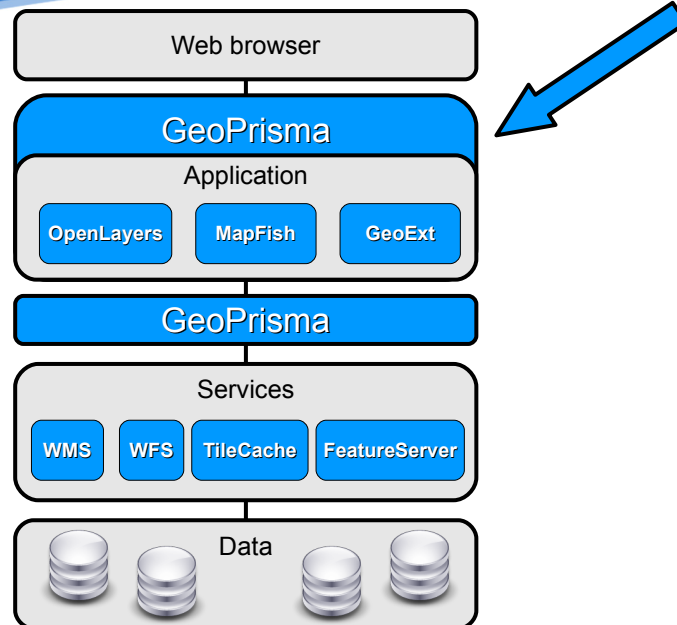
Links to external applications



Your application !

GeoPrisma can also connect to external applications. We already did it with GeoNetwork and with an application you can see in the presentation at 11:30 in Parkside G04.

Architecture with GeoPrisma



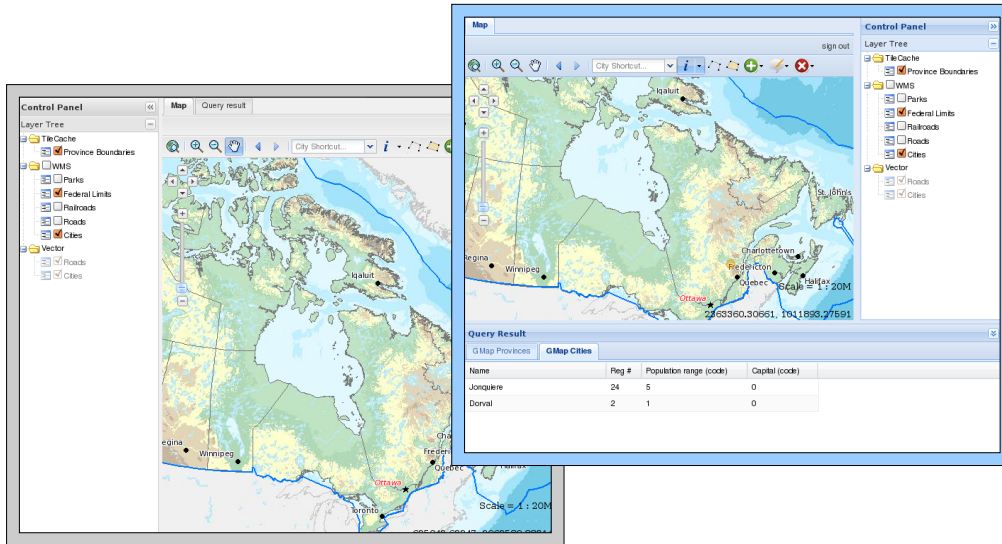
18

The second big strength of GeoPrisma is its user interface generation capabilities. In a GeoPrisma application, the UI is always automatically generated based on the user permissions.

That means that GeoPrisma generates a user interface based on specific user access. The tools can be „secured”.

Dynamic User Interface

Custom UI templates



19

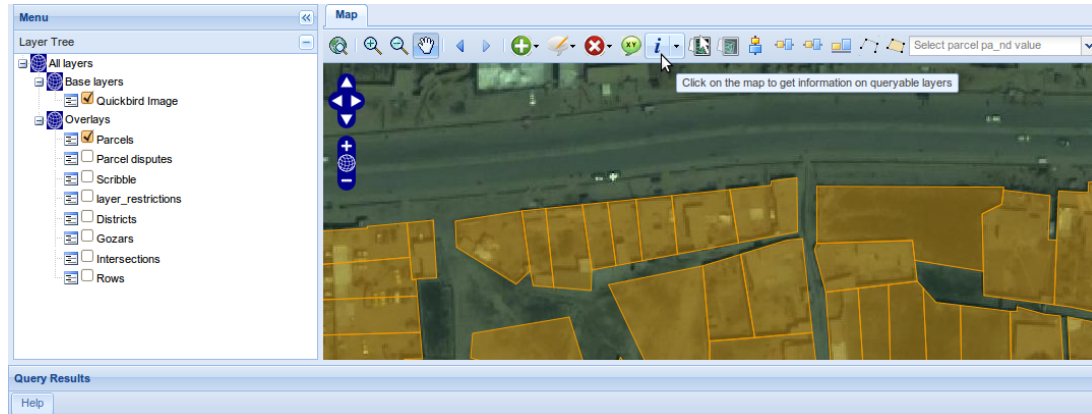
The UI is generated using a templating system, currently XSLT.

The same application can have a different look for different clients or users.

Dynamic User Interface

i18n support

English



20

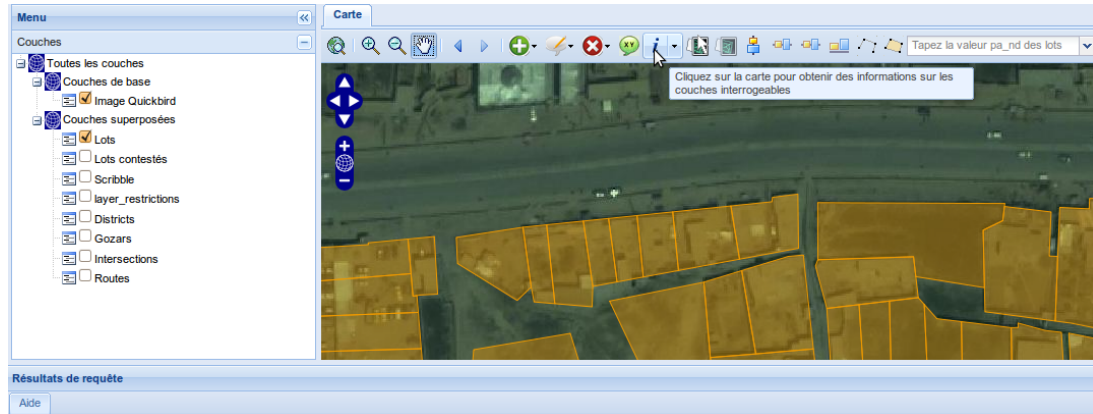
Also, GeoPrisma was built with internationalisation support from the start.

GeoPrisma's widgetry is currently available in English and French.

Dynamic User Interface

i18n support

French



21

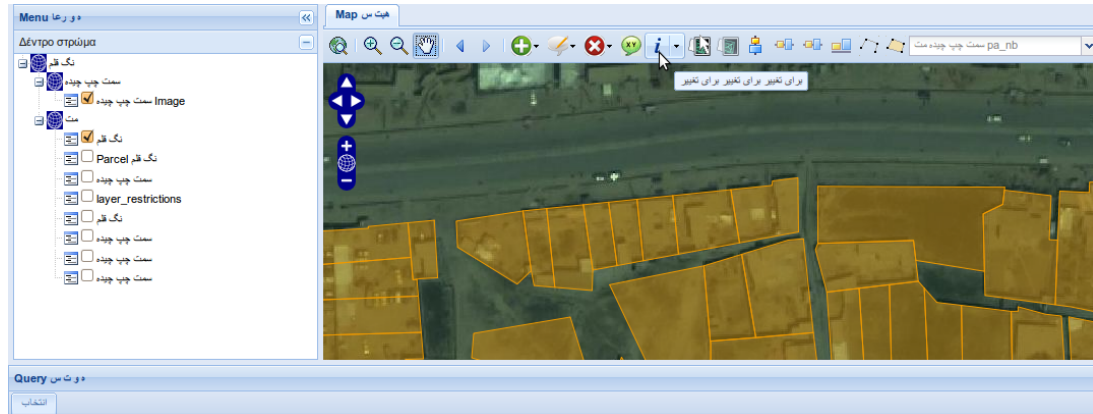
French

You can see the layer tree and tooltips text changing

Dynamic User Interface

i18n support

Non roman languages



22

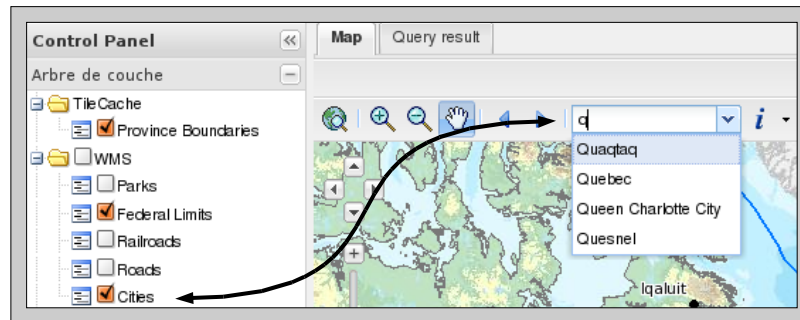
Even a non roman language !

Well, that's more a mixture of characters, but it shows right-to-left language support.

BTW, the maps you just saw are from a real world application using GeoPrisma deployed at the end of the summer.

Dynamic User Interface

Widgets automatically
added if access granted



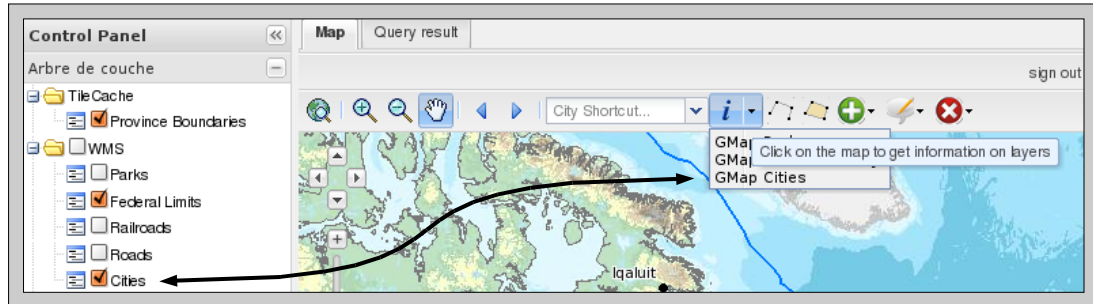
23

But let's come back to one of the main reasons you want to use GeoPrisma: the automatically generated user interface.

The tools (also known as widgets) in your application will be included only if you have the right access to the data they operate on.

Dynamic User Interface

Widgets automatically
added if access granted



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It's true for all the elements in the interface : the layers in the map and the legend of course

But also for more specific tools like the query button or the online editing features.

Dynamic User Interface

Widgets

Built with OpenLayers, MapFish, GeoExt, ExtJS, etc.

Map	Merge
MapPanel	Split
Toolbar	Scale
ZoomSlider	MousePosition
Query	MeasureTool
FeaturePanel	LayerTree
Editing tools	Recenter
InitialView	...

25

There's a nice library of widgets already included and it's growing fast. Most of them are simply the tools from OpenLayers, MapFish and GeoExt.

That's one of the key ingredients of GeoPrisma : We don't reinvent the wheel

When something is already available, we reuse it. If it's not, we do it and contribute it back to the right project. We try to not have any custom tools in our system.

Dynamic User Interface

Review : GMap sample

Resource	C	R	U	D
Base		X		
Parks				
Provinces		X		
Fed. Lim.		X		
Railroads				
Roads		X		
Cities		X		

Resource	C	R	U	D
Base		X		
Parks				
Provinces				
Fed. Lim.		X		
Railroads				
Roads		X		
Cities		X	X	X

Resource	C	R	U	D
Base		X		
Parks		X		
Provinces		X		
Fed. Lim.		X		
Railroads		X		
Roads		X		
Cities		X	X	X

Resource	C	R	U	D
Base	X	X	X	X
Parks	X	X	X	X
Provinces	X	X	X	X
Fed. Lim.	X	X	X	X
Railroads	X	X	X	X
Roads	X	X	X	X
Cities	X	X	X	X

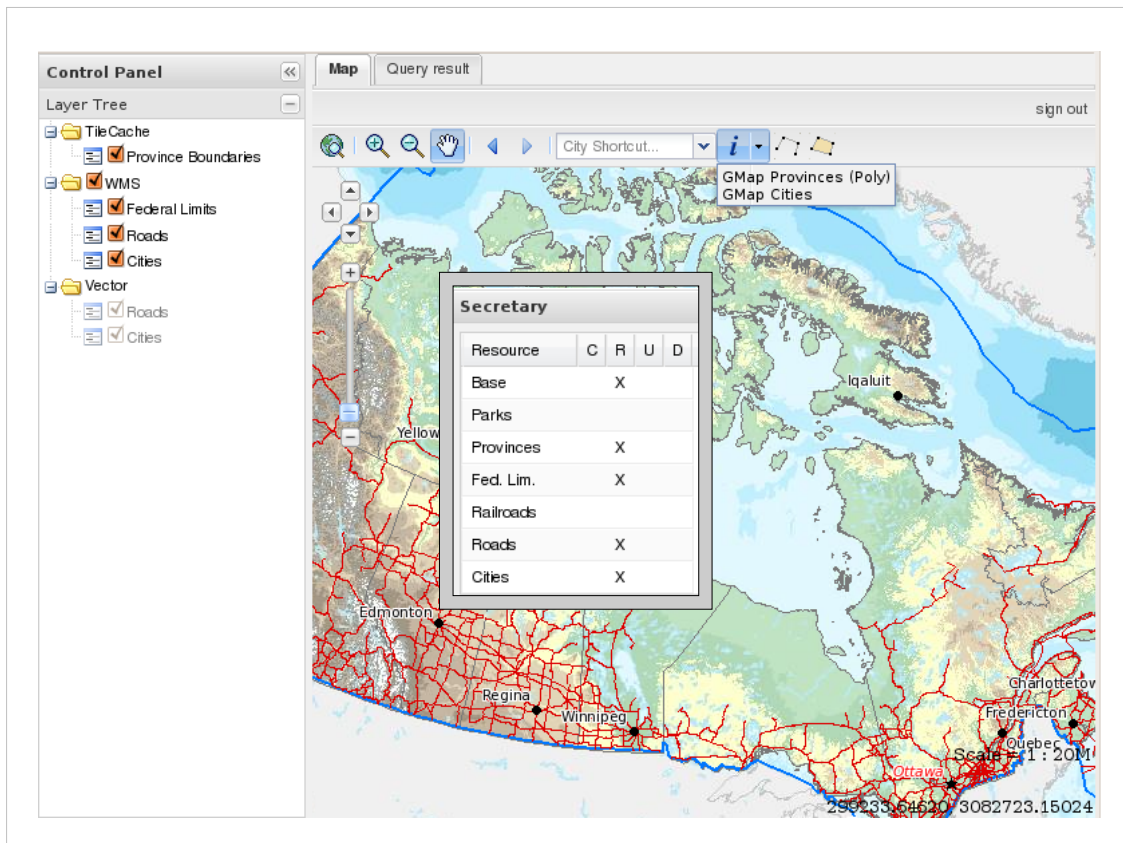
Resource	C	R	U	D
Base		X		
Parks				
Provinces		X		
Fed. Lim.		X		
Railroads				
Roads		X		
Cities		X	X	X

Resource	C	R	U	D
Base	X	X	X	X
Parks	X	X	X	X
Provinces	X	X	X	X
Fed. Lim.	X	X	X	X
Railroads	X	X	X	X
Roads	X	X	X	X
Cities	X	X	X	X

Create
Read
Update
Delete

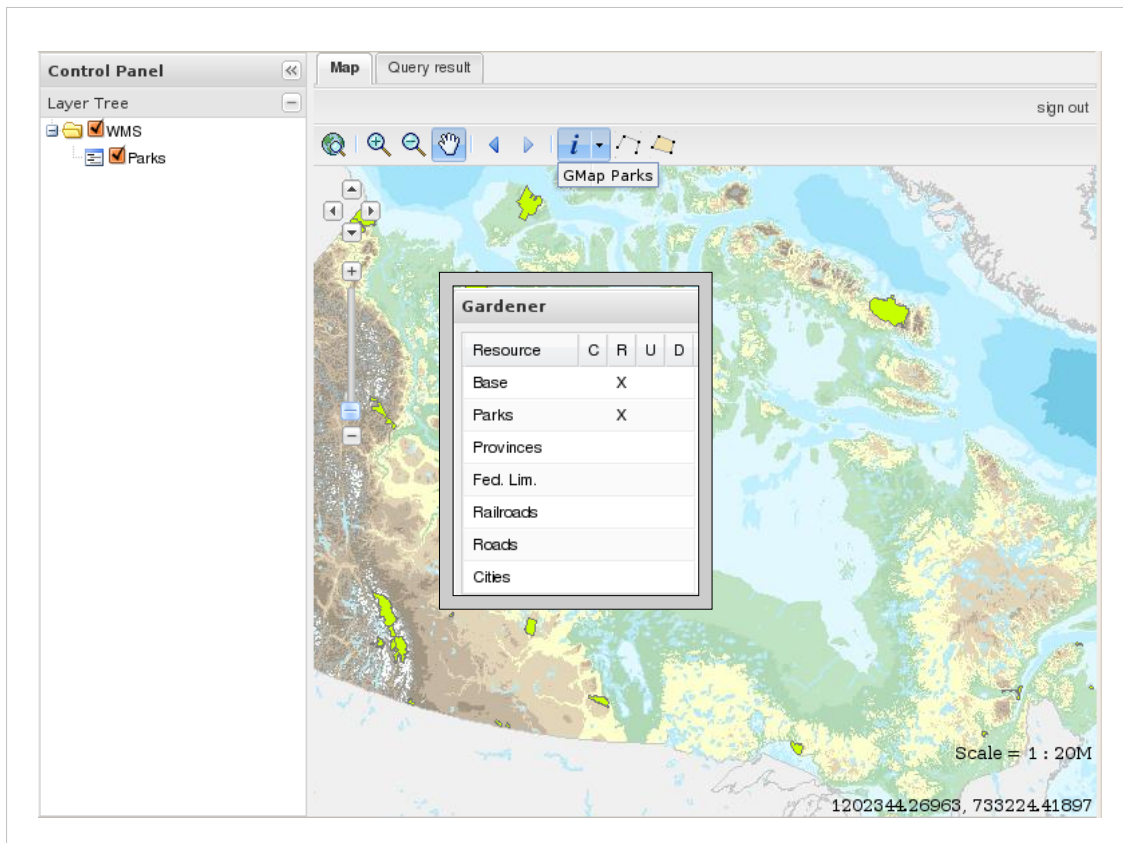
Let's see GeoPrisma in pseudo-action (a 20-minute presentation doesn't allow for a live demo ;-)

There will be 5 users with different access. Some will have read-only access and some will have read and write.



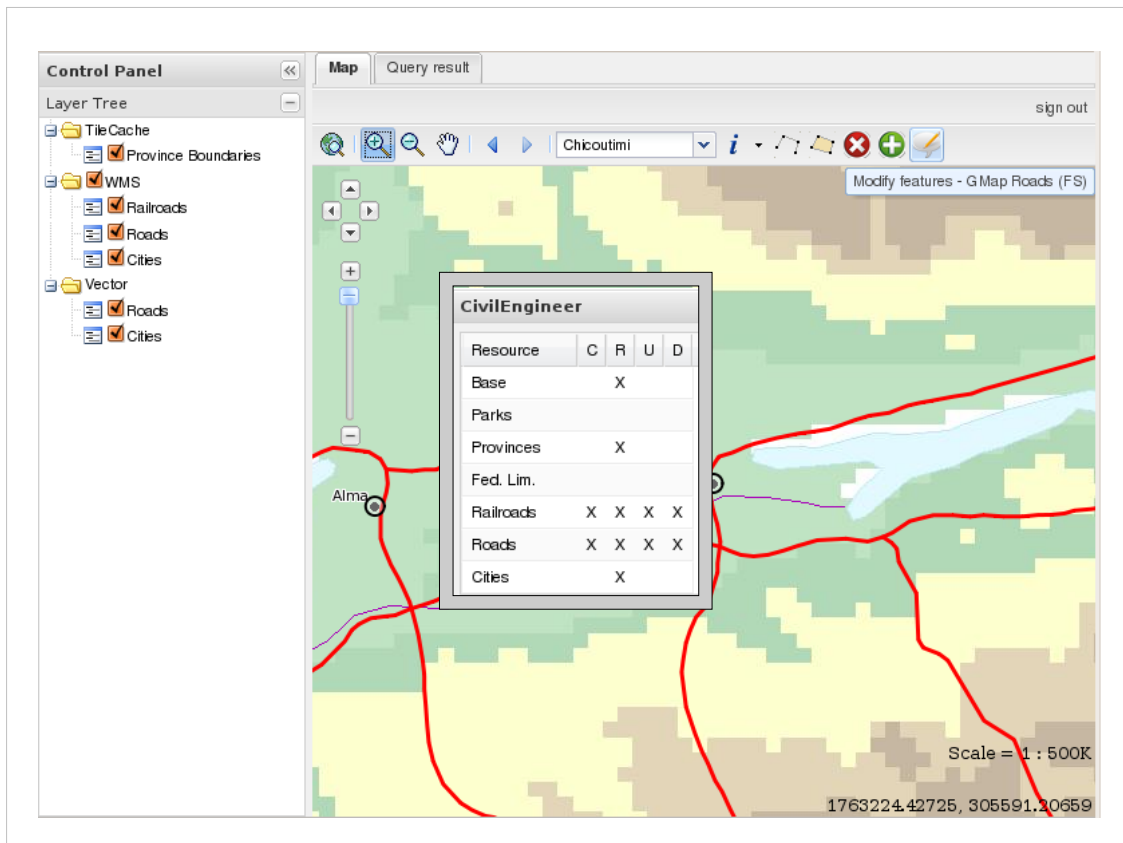
This first user, the secretary, has read-only access to most features.

The basic tools are included.



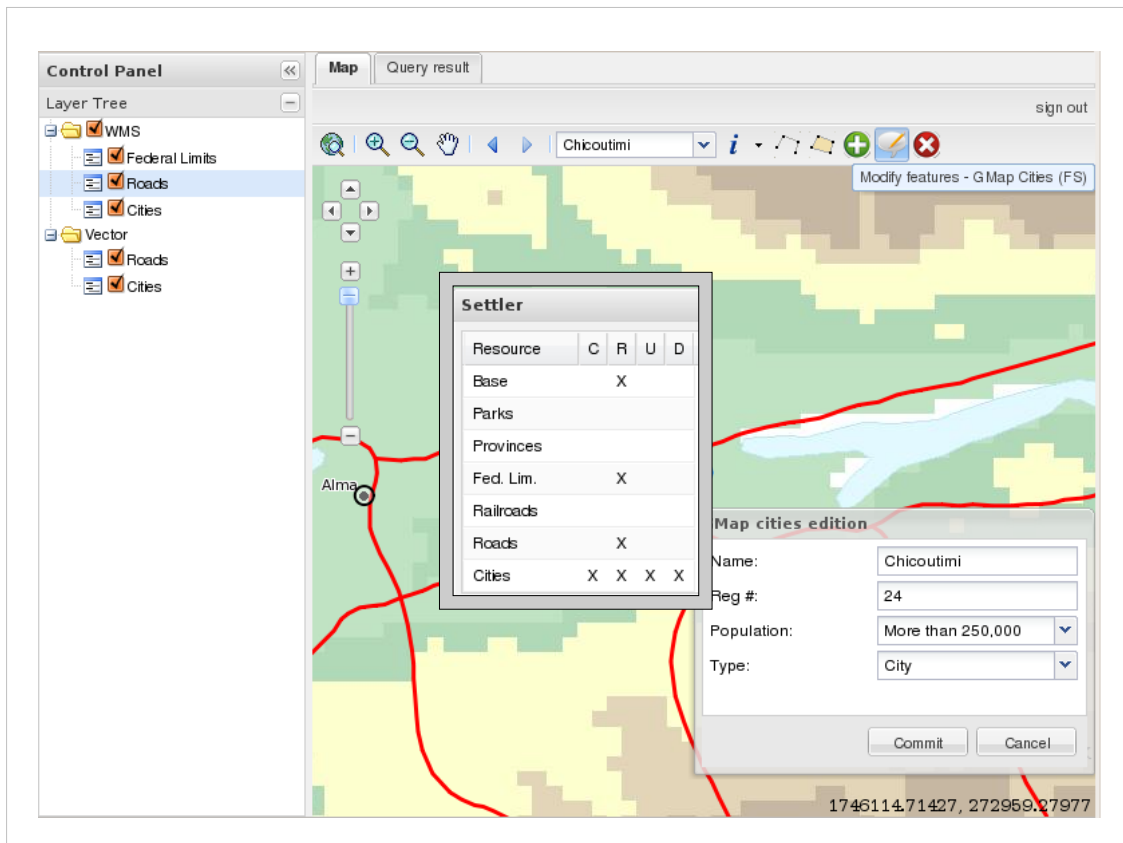
Now if we look at the gardener, you can immediately see that with less access there are fewer layers available, but also fewer tools.

Note how the gardener has the 'i' button working only for the parks. The roads are not there anymore.



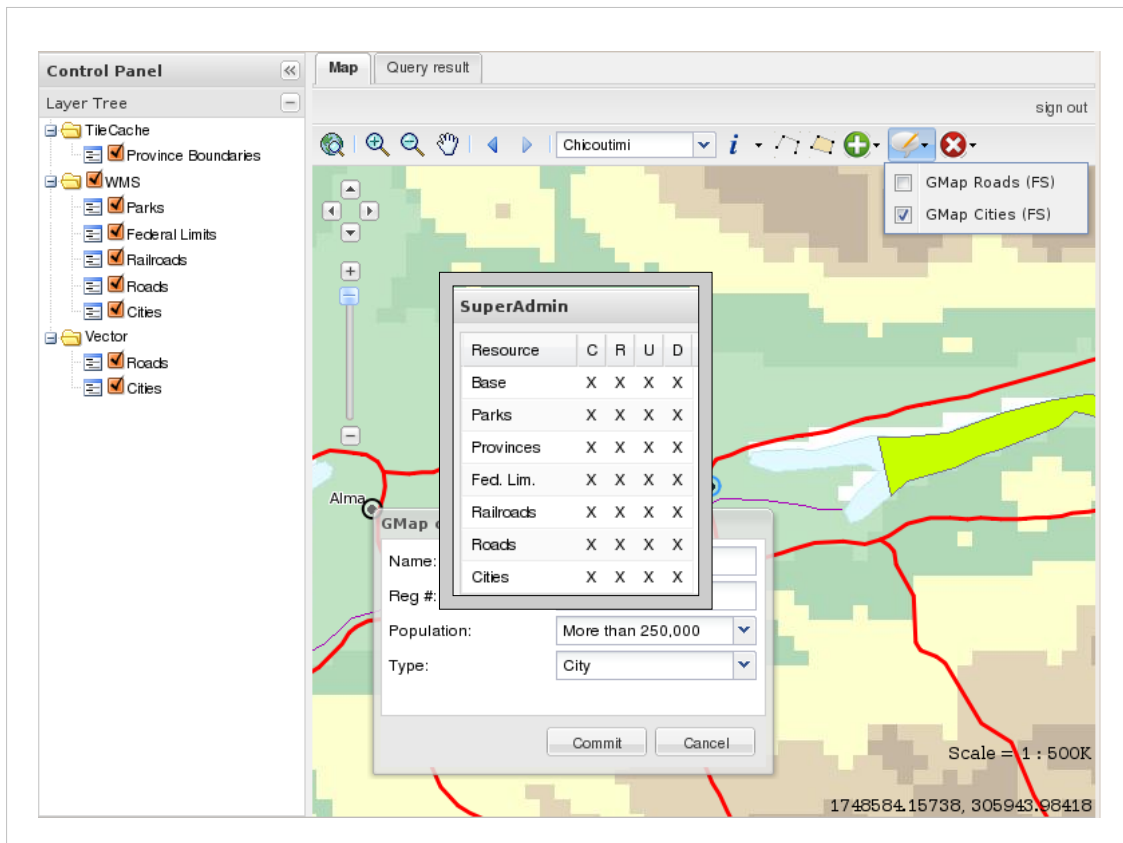
The civil engineer now, has write access to the roads, so there are new tools in the application.

Notice the editing tools and the layer tree that now contains new layers.



The settler can edit the cities as we can see.

It's important to note that as the UI is built with limited tools, the transaction on the server is also secured to make sure that the queries are not hacked.



Finally the Superadmin has:
 Full access
 Full layers
 Full widgetry

Contributors

Boreal Information Strategies Inc.
Mapgears Inc.
Nippour Geomatik

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There are three contributors right now.

The project was an initiative from Boreal-IS and was developed with the help of Mapgears.

Nippour Geomatik joined later on and used GeoPrisma to build a mapping portal.

Conclusion

We want your feedback !

<http://geoprisma.org/download>

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Boreal-IS contributed the code from GeoPrisma and it's now an Open Source project (BSD licenced). Simply go to geoprisma.org to get more information and download the zip on a web directory for a test drive.

This presentation is actually part of the official launch of the project. The same presentation is also given at around the same time in Montreal, Canada. On the other side of the planet. That's geo-diversity! :-)