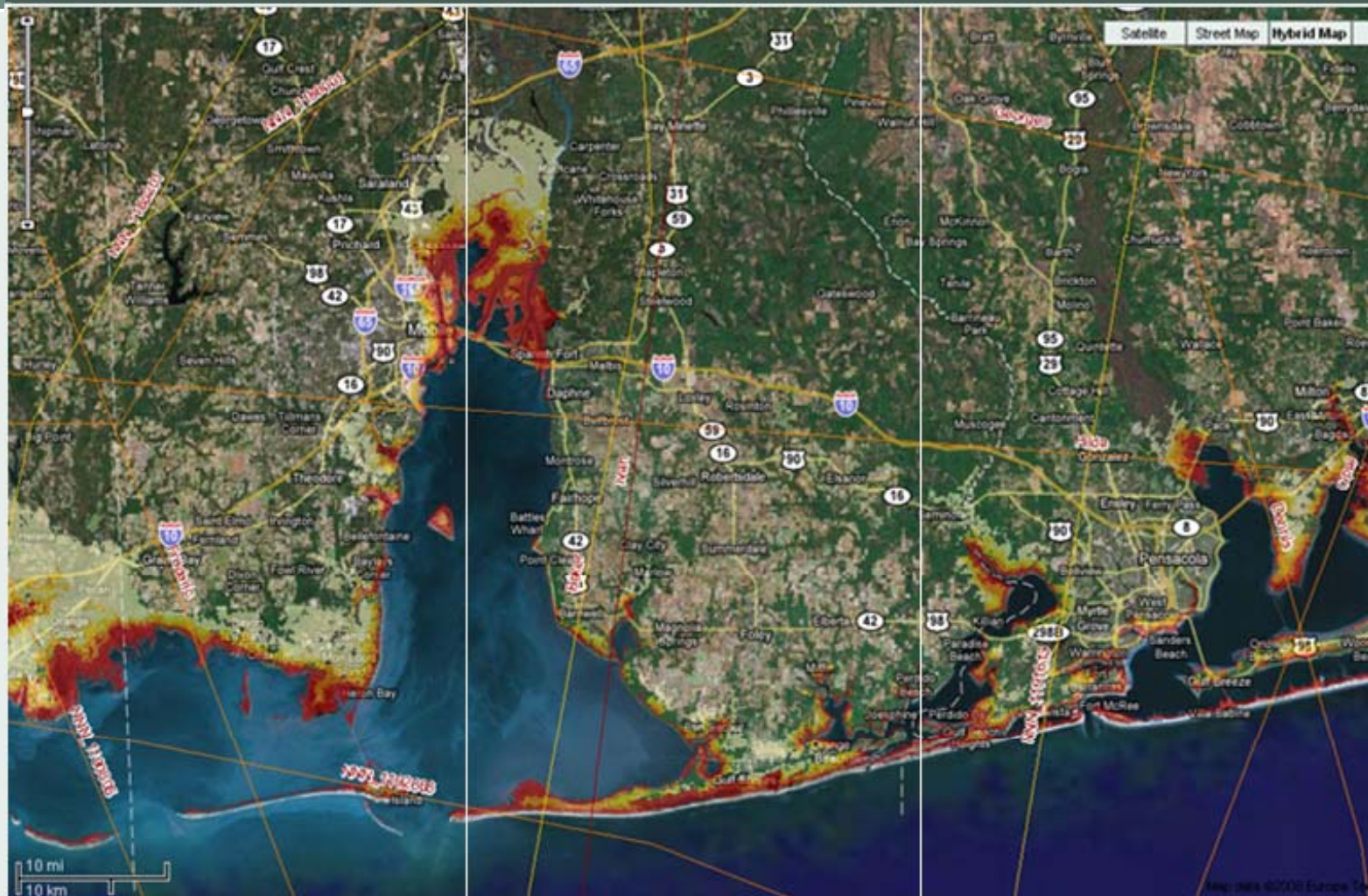


Swiss Re



# Swiss Re GEOportal

## Integrating ArcGISserver and Google Maps



ESRI User Conference  
Swiss Re GEOportal  
Marcel Andriess



## Swiss Re at a glance

- One of the world's leading reinsurance companies
- Reinsurance: Insurance for insurance companies
- Business Functions:
  - Client Markets
  - Products
  - Financial Services
  - Risk Management
- Around 70 offices in more than 30 countries
- Headquarter in Zürich, Switzerland



## GEOservices at Swiss Re

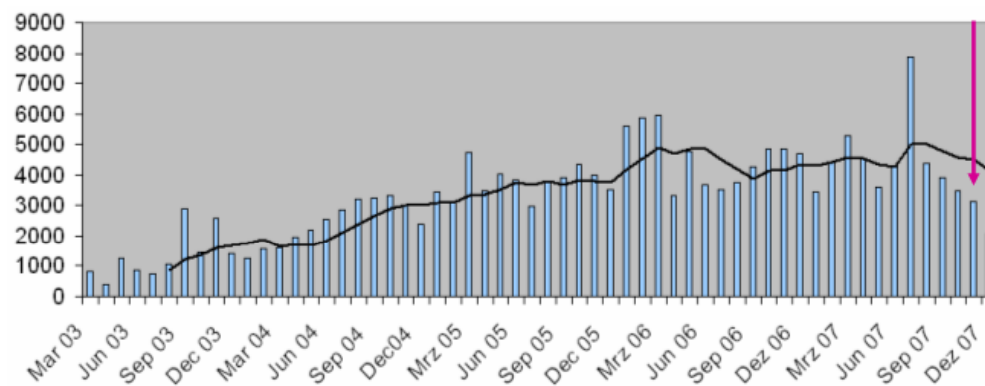
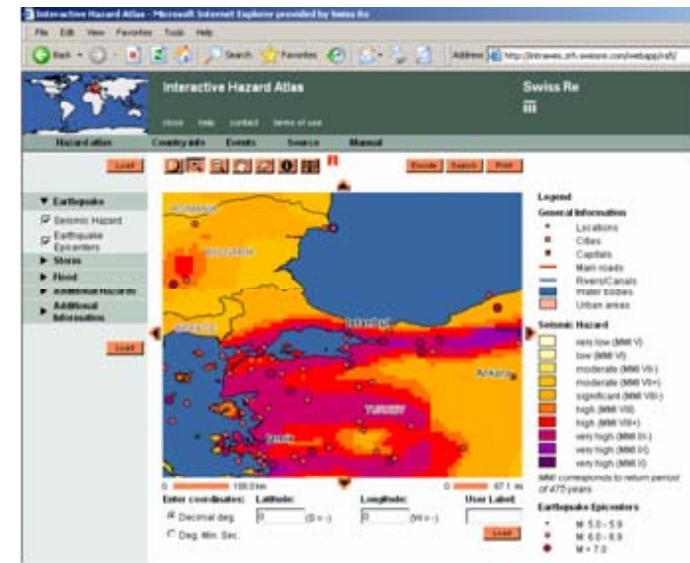
- GEOservices team is part of Swiss Re's Products Division and within the Actuarial Services & Tools Unit.
- GEOservices team is comprised of 4 GIS specialists.
- Tasks of GEOservices Team:
  - Responsible for Swiss Re' centralized GEOdatabase
  - Provide J2EE GIS Services for Swiss Re applications  
(link insurance portfolio risks with GEOdatabase locations for pricing)
  - Group wide support for geographical issues





# GEOservices at Swiss Re

## Swiss Re Interactive Hazard Atlas 2001 - 2008





# GEOservices Client Survey

## Gis data needed to fulfill our clients needs



*Swiss Re Hazard Risk Layers*



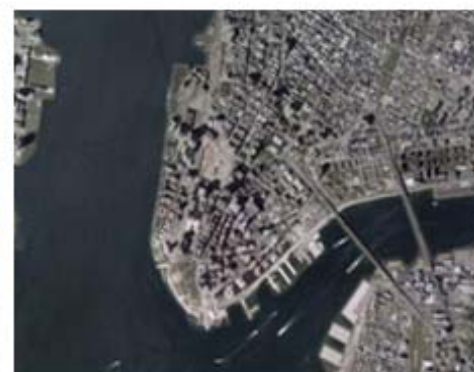
*Swiss Re Risk Locations*



*High resolution grids*



*Google Maps*



*Google Maps Imagery*



*Google Maps Elevation data*



# GEOservices Client Survey

## Functionality needed to fulfill our clients needs

### Functional requirements

- Search locations and geocode addresses
- Import user data (kml/kmz, Excel or Text files)
- Information of a selected location
- Easy to navigate and to change the map content

### Non- Functional requirements

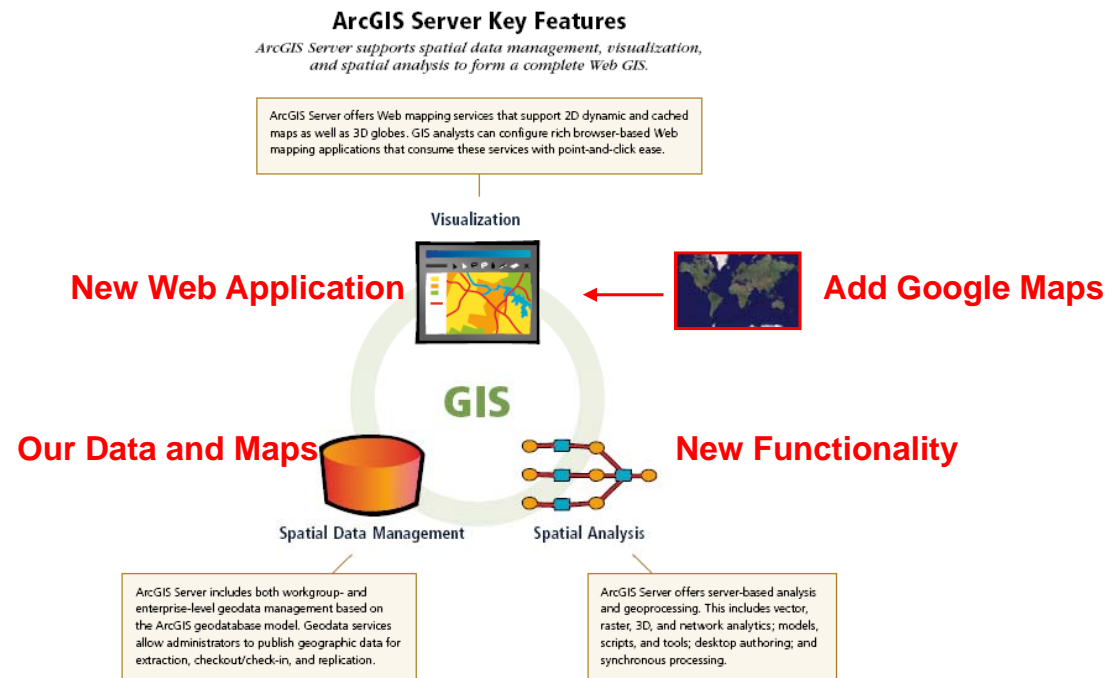
- Available for all Swiss Re employees
- Good performance
- Easy to maintain
- Flexible for the future expansion



# GEOservices Client Survey

## How to fulfill our clients needs?

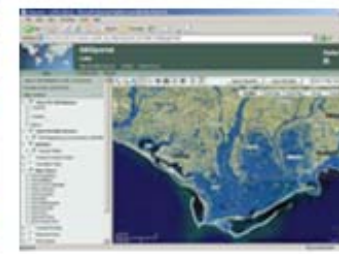
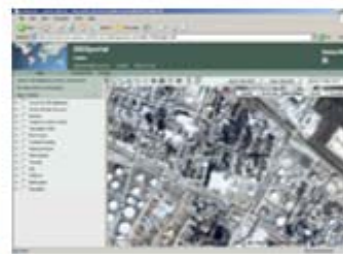
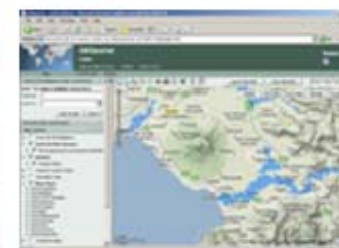
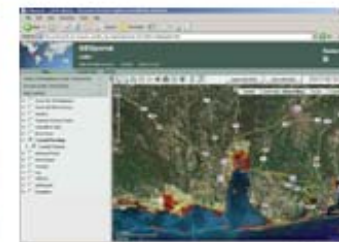
- Develop a new web application based on ArcGIS Server Technology that allows us deliver to the data and functionality our clients need
- Integrate Google Maps into this new ArcGIS Server Web Application







# Demo GEOportal







# GEOportal Server Side

ArcGis Server Web Mapping Application is the starting point.

## Changes

- Additional functionality
- Integration of existing Swiss Re services  
(e.g. Search in GEOdatabase using cached results, alias tables, hierarchical search)
- Google Maps Integration

## Implementation

- ESRI Java Web ADF
- Task Framework
- ArcGis Server Webservices (SOAP API)
- Java ArcObjects
- Extensive use of AJAX technology

# GEOportal Web GUI

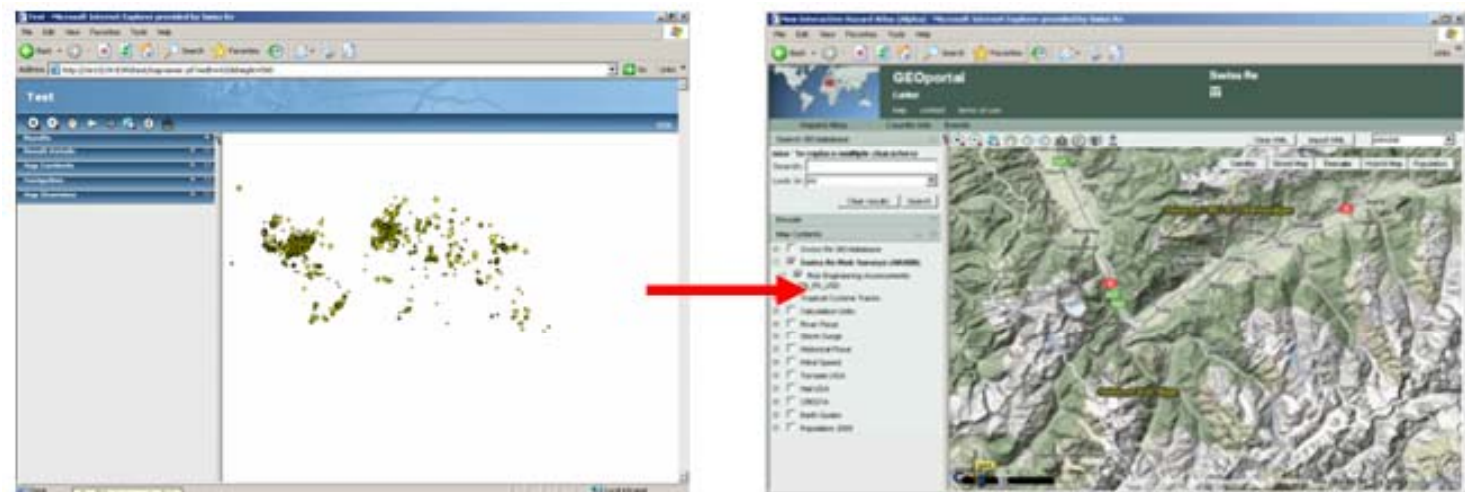
ArcGis Server Web Mapping Application is the starting point.

## Changes

- Adjustment to Swiss Re Corporate Identity
- Additional GUI components and functionality

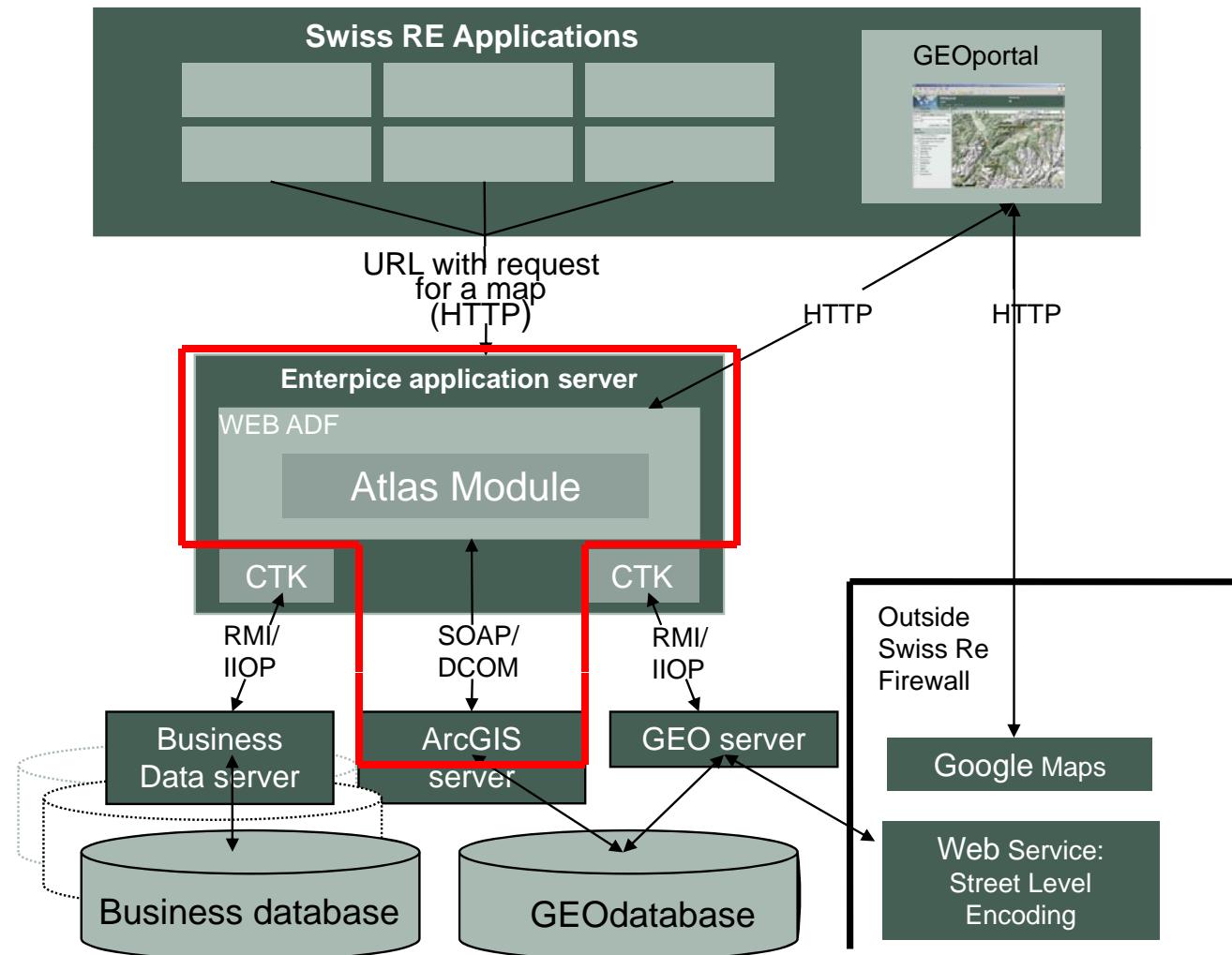
## Implementation

- Adjustment of the GUI with Java Scripts and Cascading Style Sheets (CSS)
- Many changes in the ESRI Java Scripts files
- Need for an experienced Web GUI programmer!





# GEOportal within the Swiss Re Tool Landscape





# GEOportal Server Architecture & Infrastructure

## Software

- Geographic Information System (GIS)
  - ArcGIS Server 9.2 (ESRI)
  - ArcSDE 9.2 (ESRI) => Oracle 10g
- OpenLayers Java Script API for Google Maps integration
  - Project of Open Source Geospatial Foundation
- Websphere Application Server
  - WAS 6.1 Base Edition

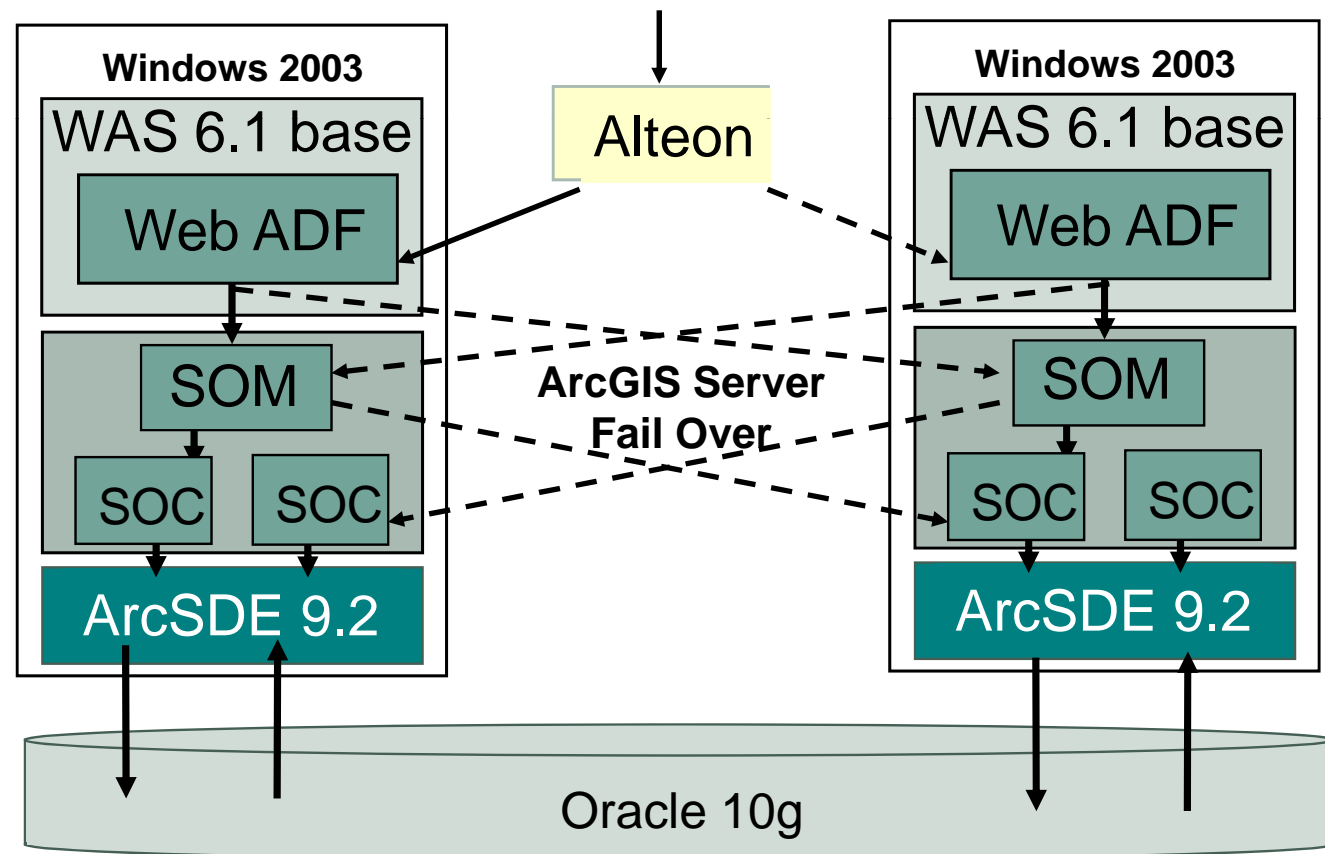
## Hardware

- Operating System
  - Windows 2003 Server
- Production server
  - 2 x HP DL 585 with 4 cores each with 2 CPUs and 32 GB RAM



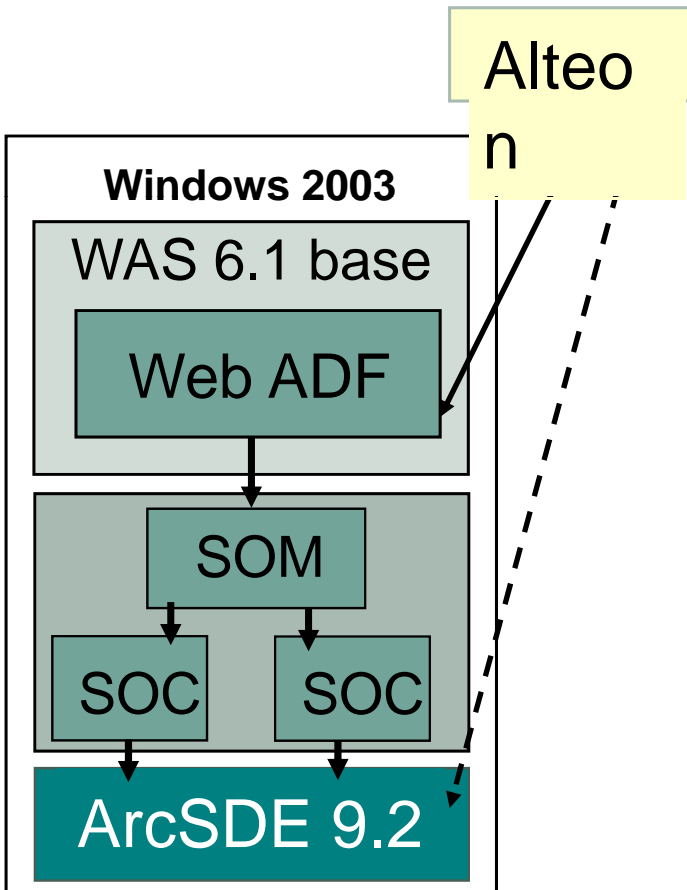


# GEOportal Server Architecture & Infrastructure





# GEOportal: Monitoring and Watchdogs



### Alteon Health Checks

- TCP/IP and Port check
- ArcSDE (TCP connection)

### Action

- Switch Server
- Switch Server

### Service Monitoring Process ID (MOM Windows)

- ArcSOM
- ArcSDE
- WAS 6.1

- Restart
- Restart
- Restart

### Watchdogs

- WAS 6.1
- ArcGIS Server SOM

- Restart, Alarm
- Restart, Alarm

### Monitoring

- BAM Monitor (Roboter)

- Alarm



# GEOportal Google Maps Integration

## Workflow “ArcGis Server – Google Maps”

1. The navigation of the user is controlled by the ArcGis Server. (Not by the Google Maps API)
2. The ArcGis Server calculates the current map extent and sends this coordinates to the client
3. The ArcGis Server sends the necessary ArcGis Server Maps to the client
4. The background color of the ArcGis Server maps are set to transparent
5. The client requests Google Maps from Google without them being loaded to the ArcGis Server.
6. Google Maps are loaded behind the ArcGis Server maps



*ArcGis Service Map*

*Google Map*

*Web Application*



# GEOportal Google Maps Integration

- Google Imagery are directly loaded to the web application. Less load on the Server!!!
- Use OpenLayers Java Script API from Open Source Geospatial Foundation  
<http://openlayers.org/>
- Use of the Google Maps API  
<http://code.google.com/apis/maps/>
- Map Services have the same projection as the Google Maps (Mercator).
- Map Services have the same caching levels as Google Maps.
- Set transparency for the background for each layer.
- Enterprise License Agreement with Google for usage of Google Maps.





# GEOportal Map Services

## Cartography for Map Services in ArcGisServer

- Cartography is prepared using ArcGis Desktop
- ArcGis Server Manager has easy to use and fast tools to publish maps
- Advanced options for symbology are supported
- Different projections are supported
- Scale dependend labeling and maplex are supported
- No scale dependent symbology. ☹️
- Table of content of the Web application is automatically updated
- Adding a layer to the Web Application is easily done in a configuration file

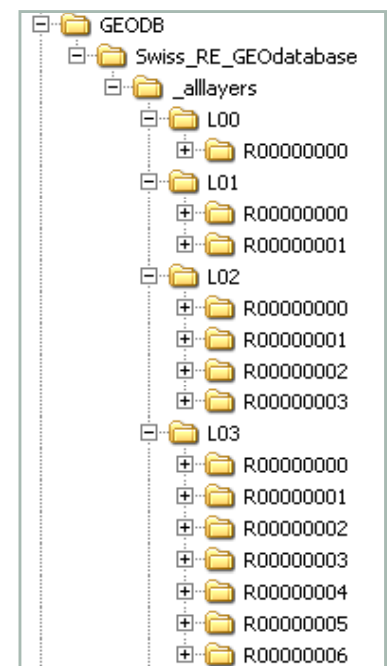
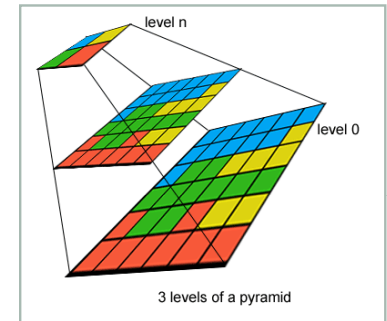




# GEOportal Map Caching

- Extensive use of Map Caching to improve performance
- ArcGis has excellent tools for Map Caching
- 10 Cached Map Services with a World Wide coverage
- 15 Caching Levels (The first 15 Google Levels)
- > 20 Million images
- > 80 GB
- Calculation time between 2 and 10 hours per layer
- Many parallel instances and SDE connections
- Use of Python Cache Update scripts from:

<http://blogs.esri.com/Dev/blogs/arcgisserver/archive/2007/07/12/Strategies-for-large-caching-jobs.aspx>





# GEOportal Effort

## Effort to build GEOportal 1.0

- Java Server development 4 Months
- Web GUI development 5 Months
- Project Management 2 Month
- Data preparation 2 Months
- Testing 1 Month
- Support from Swiss Re IT
- Support from ESRI

# GEOportal – The road ahead

## Plans for GEOportal 1.1

- Direct links from Swiss Re business applications
- Selection based on attributes and location
- Visualization and export of tables
- Visualization of business data
- PDF Output

