Secure your GIS

Protecting GIS applications suites
Outline

- Camptocamp SA
- Introduction
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  - Heterogenous FOSS applications
  - Geospatial applications
- Landscape
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  - Geoserver
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  - 52° North WSS
  - Deegree
- Examples of Complete Solutions
- Resources
- Open Source solutions provider as editor and integrator
- Staff of 35 in Switzerland and France
- Camptocamp helps you move forward with the latest Open Source technologies
Camptocamp activity domains

**Geospatial Solutions**
- Webmapping
- GIS
- Geospatial databases
- Spatial Data Infrastructure
- OGC Web Services

**Business Solutions**
- ERP
- Business Intelligence
- ETL

**Infrastructure Solutions**
- Linux
- HTTP, Apache Load balancing
- Cloud computing (AWS)
- VoIP

Consulting, Research & Development

Engineering, Implementation

Open Source Support

Training
Green field

- Non-geospatial is easy
- Most frameworks have security components
  - Choose framework of choice
  - Develop applications

- Framework Evaluation
  - Single Sign on
  - Authentication mechanisms (LDAP, Database, CAS, OpenID)
  - Authorization mechanisms (LDAP, Database)
Suite of FOSS Applications

- Different application frameworks
- Different Languages
- Different frameworks supporting different options
- Challenging for sysadmins to configure
- Single Sign on may be required (or at least desirable)
Geospatial aspect

- Typical frameworks do not support Geospatial domain
- Most frameworks allow URL restrictions for queries like:
  - http://myservice/ows?service=wms&layer=***
- Cumbersome security
- BBox queries are difficult
Non-spatial Solutions

- Framework X security
  - Not useful for retrofitting heterogenous application suite

- Security Proxy
  - http://www.google.ch/search?q=security+proxy
  - Not all are open source solutions

- Spring Security
  - Good basis for a security proxy
Geospatial solutions

- Geoserver (embedded security)
  - www.geoserver.org

- Secure OWS (security proxy)
  - www.secureows.org/

- 52° North Web Security Service (security proxy)
  - 52north.org/maven/project-sites/security/

- Deegree (embedded security)
  - wiki.deegree.org/deegreeWiki/deegree3/SecuritySubsystemDocumentation
Proxy VS embedded

- Client -> Proxy -> Server 1
- Client -> Proxy -> Server 2
- Client -> Server 1
- Client -> Server 2
Hybrid Proxy/Embedded (Geoserver)
Proxy VS Embedded

- Both have advantages

- Proxy
  - Forward all requests (Can cause problems for performance)
  - Only one place for all security configuration
  - Can secure many servers

- Embedded
  - Potentially less load on servers and possible better performance
  - Deeper integration and therefore (theoretically) less chance of misconfiguration
  - Less complicated configuration
Geoserver

- Built-in geospatial security
- Services Secured
  - Web Feature Service (WFS)
  - Web Map Service (WMS)
  - Web Coverage Service (WCS)
  - WFS Proxy
  - WMS Proxy
- Security Axes
  - Layer
  - Namespace
  - Service
Geoserver Pro/Con

- **Pros**
  - Performance, no proxying requests
  - Based on Spring/Acegi security
    - Support almost all authentication and authorization schemes
    - Large community testing and using it
    - Very flexible
  - Supports most common protocols
  - Simple/powerful configuration options

- **Cons**
  -Extent restriction not supported
  - Projection restriction not supported
  - Non-standard configuration files
SecureOWS

- Geospatial Security Proxy
- Services Secured
  - WMS
  - WFS
  - WCS
- Security Axes
  - Layer
  - Service
  -Extent
  - MapSize
  - Projection
SecureOWS Pro/Con

- Pros
  - Fine grained security configuration options
  - Can secure an number of servers
  - Provides a client for managing connections
    - https://www.secureows.org/trac/secureows/wiki/ClientSoftware

- Cons
  - Proxy solution
  - Non-standard configuration files
  - Limited number supported authentication/authorization mechanisms
52° North WSS

- Geospatial Security Proxy
- Services Secured
  - WMS
  - WFS
- Security Axes
  - Layer
  - Service
  - Extent
  - Projection
52° North WSS Pro/Con

- Pros
  - Standards compliant configuration files
    - I have not found any other implementations, please let me know of more solutions
  - Fine grained security configuration options
  - Can secure any number of servers
  - Pluggable architecture

- Cons
  - Limited number supported authentication/authorization mechanisms
  - Limited number of services supported
  - Proxy issues
Deegree

- Embedded security
- Proxy options?
- Services Secured
  - WMS
  - WFS
  - WCS
  - CSW
- Security Axes
  - Service
Deegree Pro/Con

- Pros
  - Embedded security
  - Many types of services supported

- Cons
  - Very limited documentation
  - Limited number supported authentication/authorization mechanisms
  - Poor granularity of security options
Complete Solution 1

- Geoserver and App2 obtain authorization from proxy
- Or Proxy controls access based on URL patterns
- Geoserver has same configuration as proxy and accesses CAS and LDAP directly.
Complete Solution 3

- Embed proxy within Geoserver
Wrap up

- 52° North WSS seems like one of the best Geospatial solution
  - Lacks plethora of authentication strategies for application suite
- Geoserver is not as advanced Geospatial
  - Spring Security more than makes up when securing an application suite
- SecureOWS client is useful for Applications like ArcView
Resources

- Camptocamp
  ▪ http://www.camptocamp.com/

- GeoServer
  ▪ http://www.geoserver.org/

- SecureOWS
  ▪ https://www.secureows.org/

- 52 North
  ▪ http://52north.org/maven/project-sites/security/

- Deegree
Thank you for your attention

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