

Web 3D Service & CityGML Update

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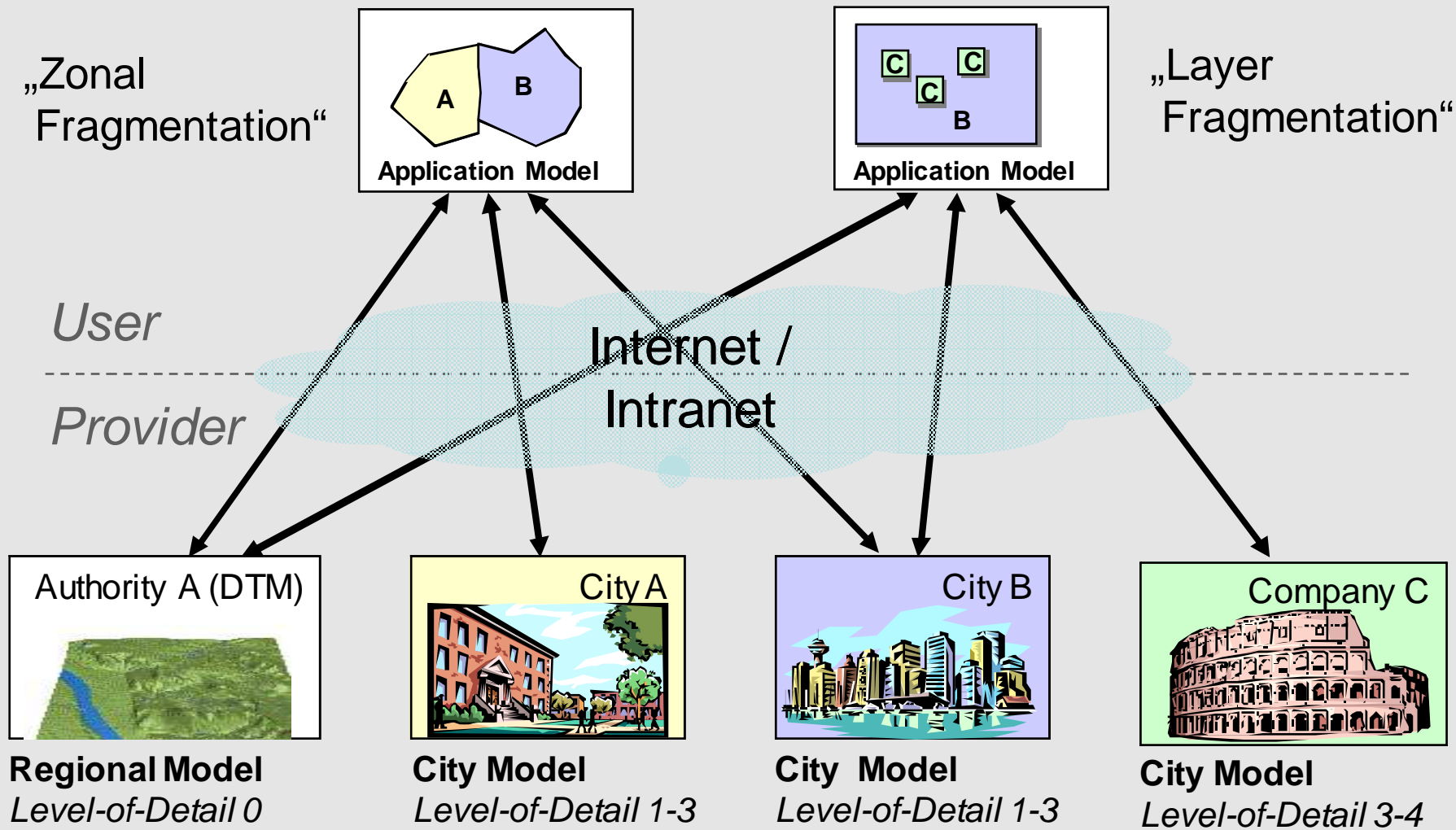
2nd of November, 2007

X3D Earth / OGC 3DIM meeting at Schlumberger, Boston

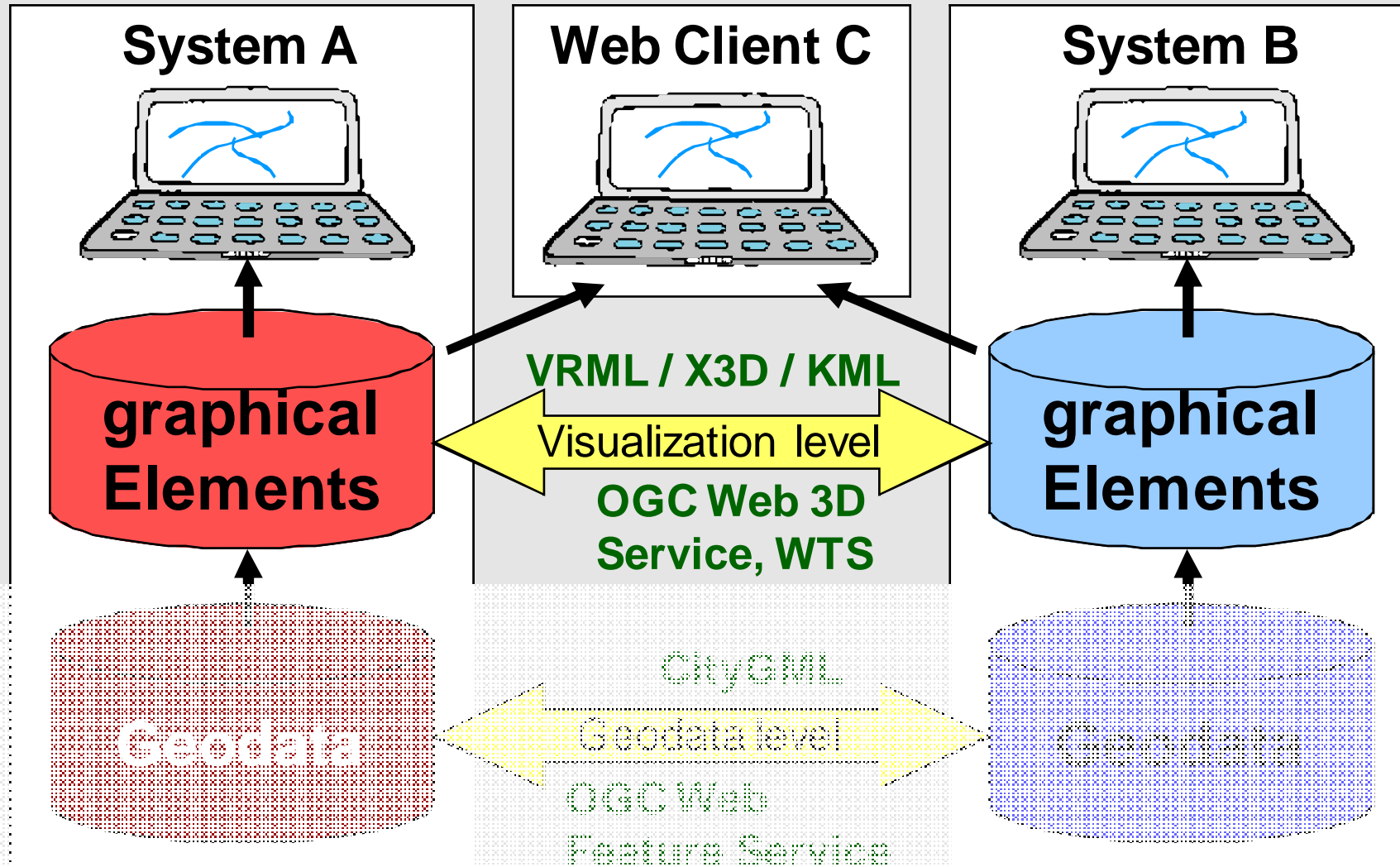


- ▶ Introduction
- ▶ Web 3D Service
- ▶ CityGML
- ▶ Application Domain Extensions to CityGML
- ▶ CityGML Application examples

Integration of Geospatial Information

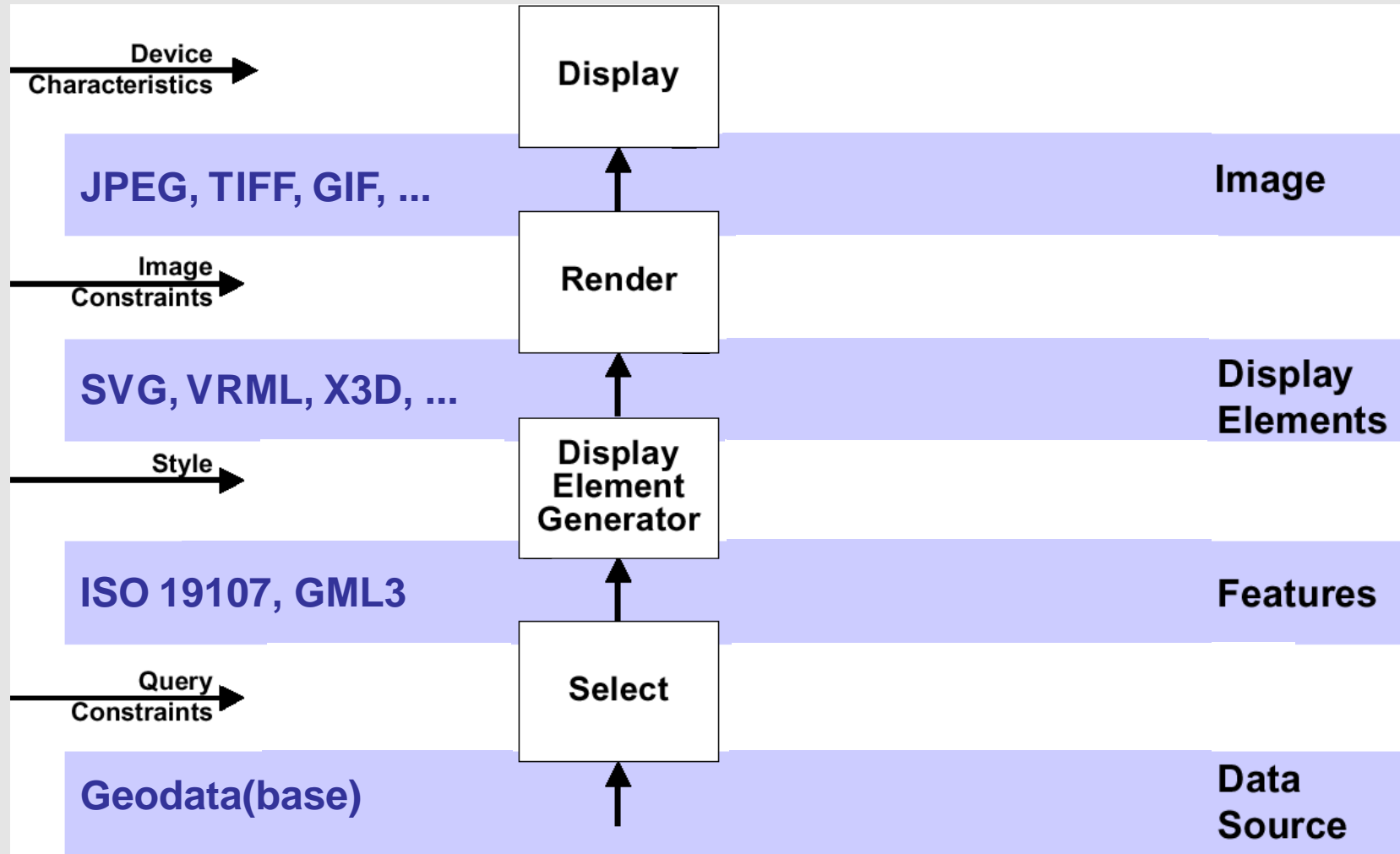


Different Stages of Information Integration



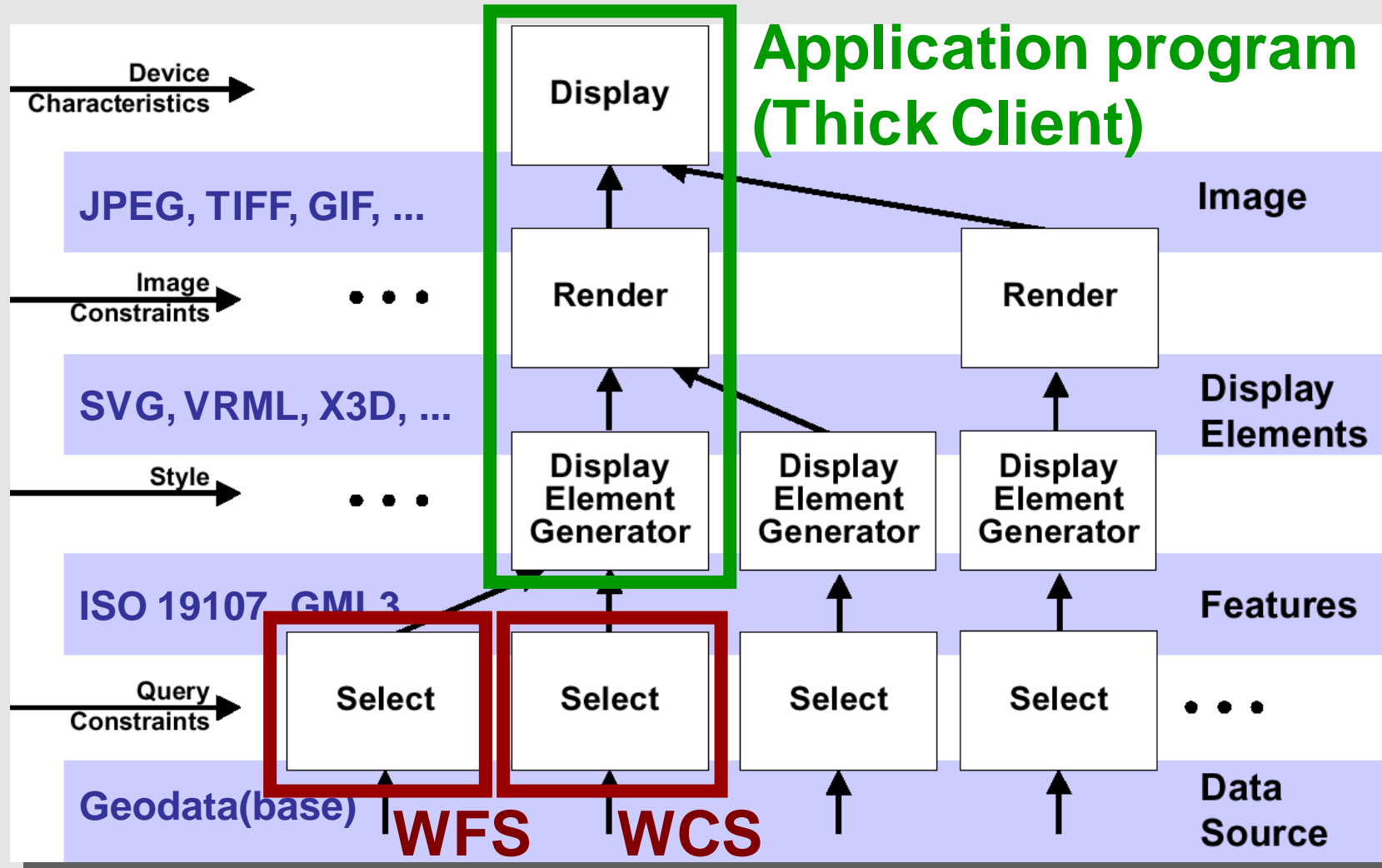
OGC
Web 3D Service
(W3DS)

Distributed geo-visualization (I)



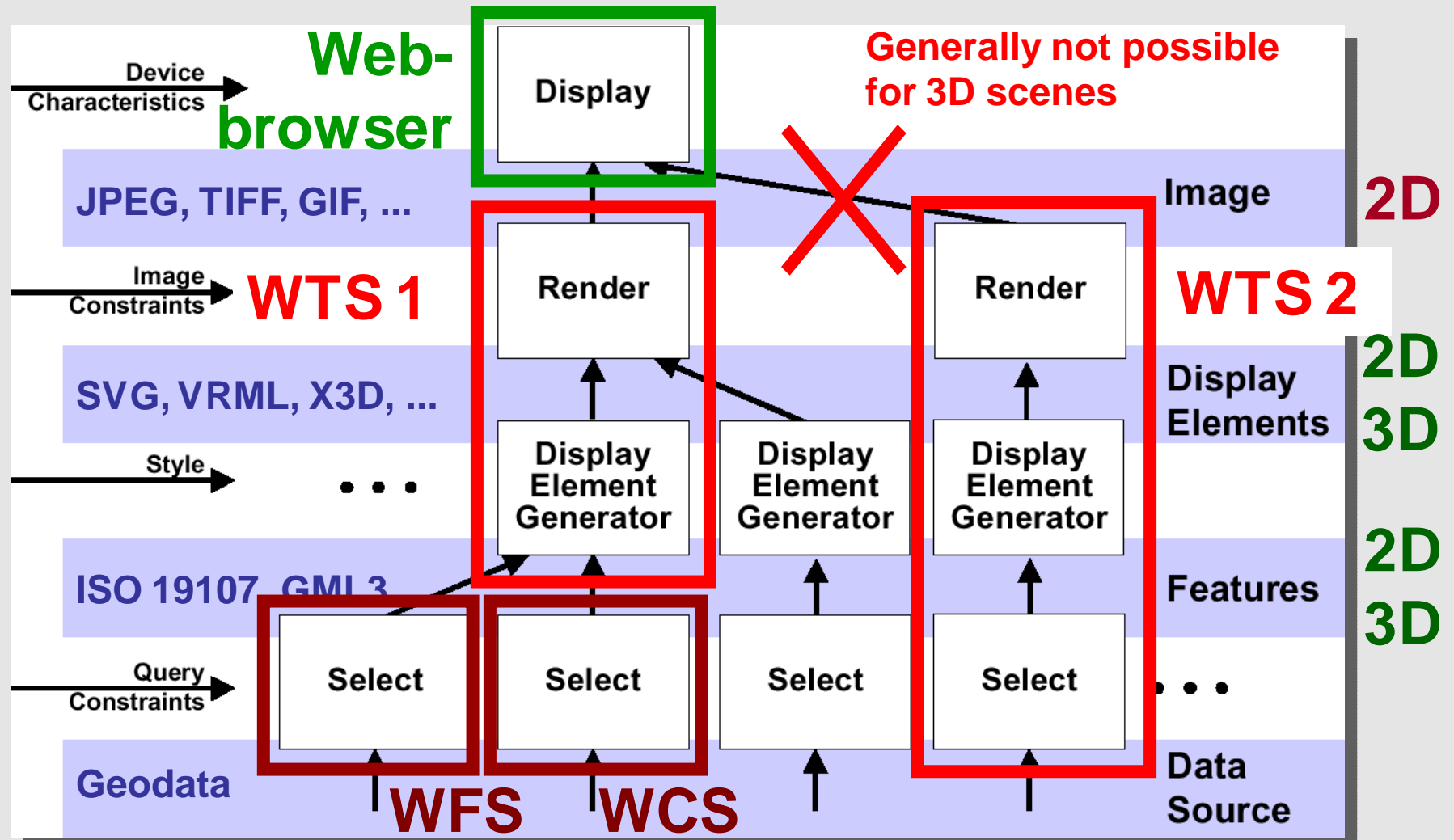
From: Doyle & Cuthbert: Essential model of portrayal, OGC Document 98-061

Distributed geo-visualization (I)



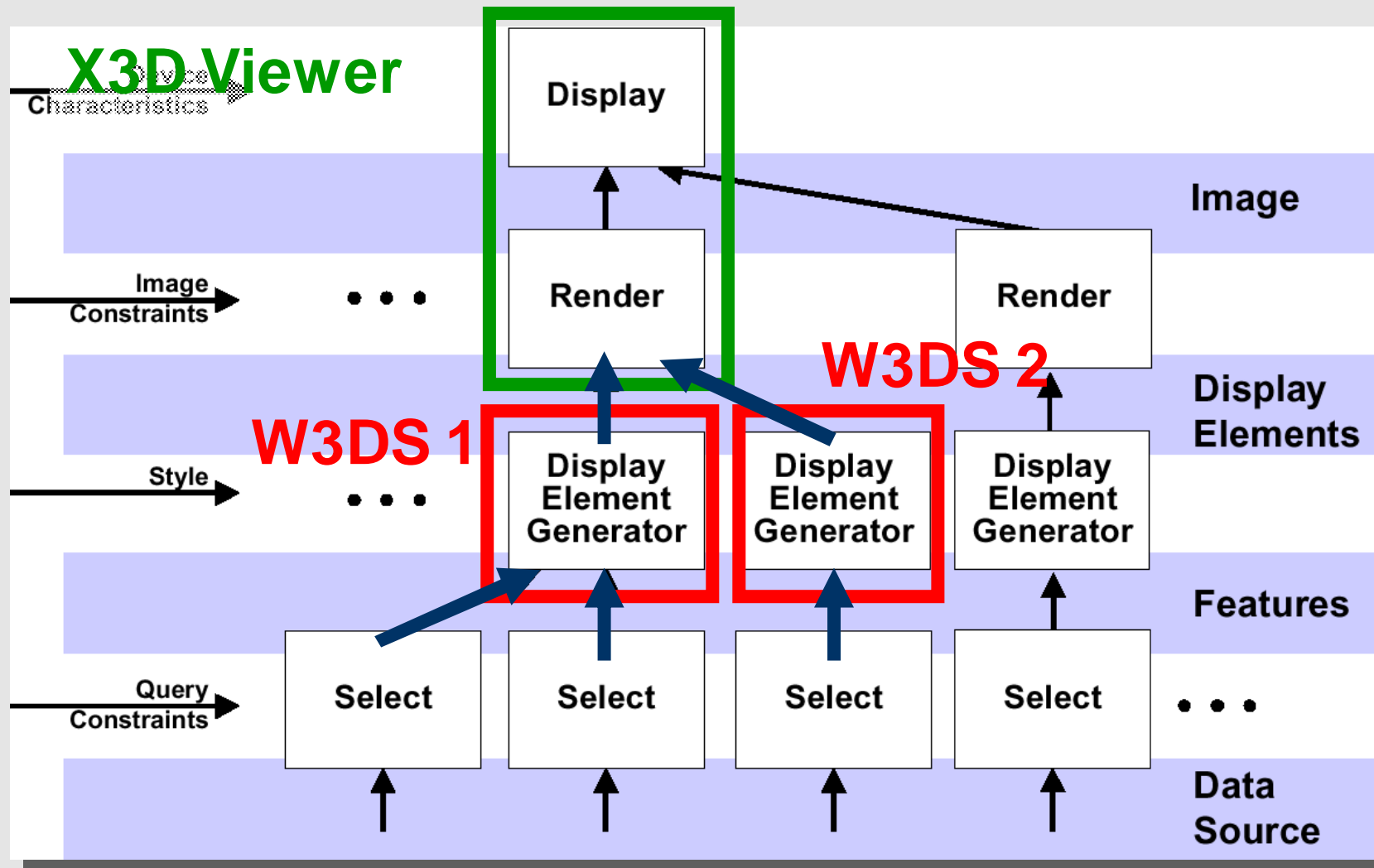
From: Doyle & Cuthbert: Essential model of portrayal, OGC Document 98-061

Distributed geo-visualization (II)



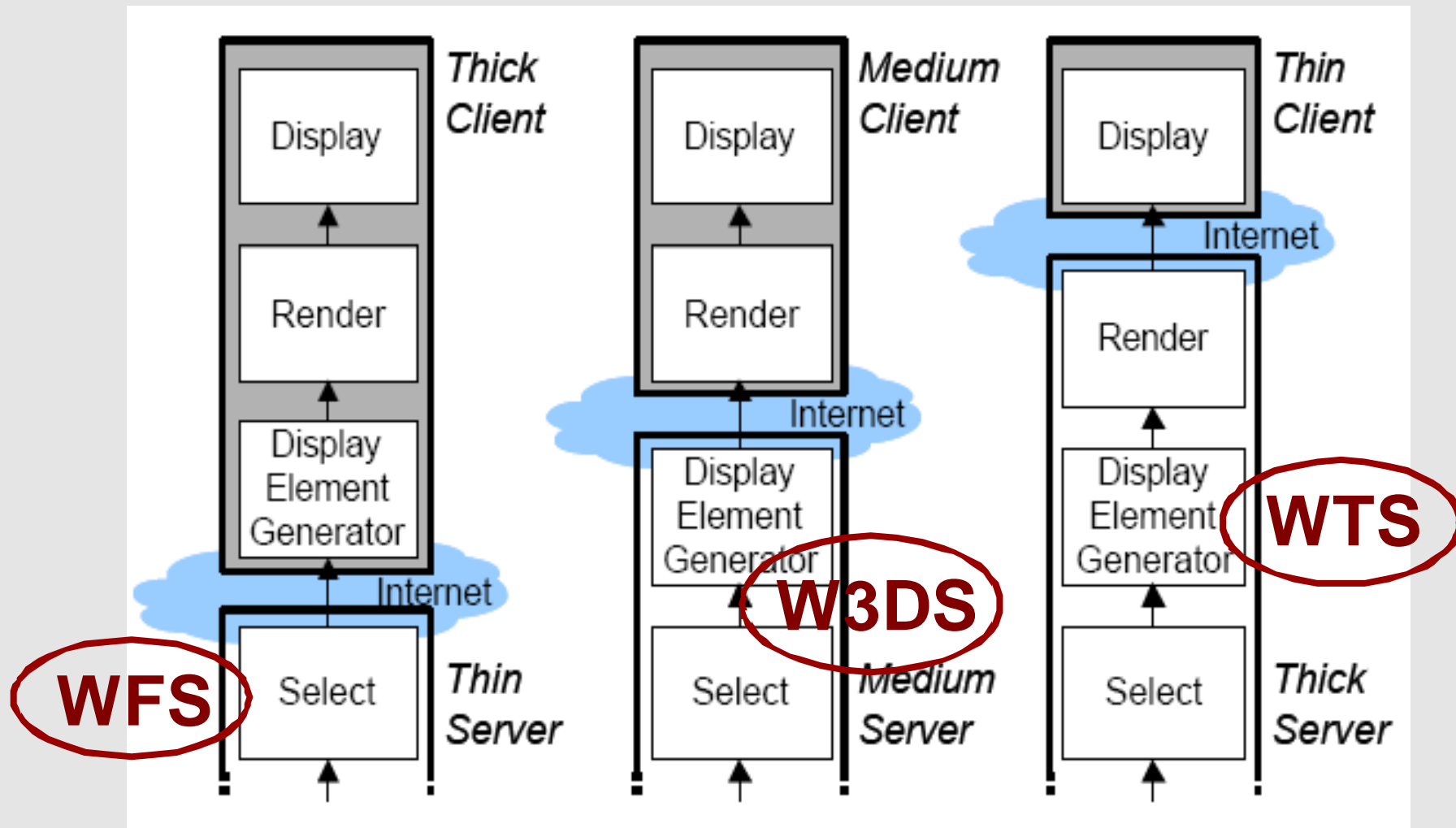
From: Doyle & Cuthbert: Essential model of portrayal, OGC Document 98-061

Distributed geo-visualization (III) with W3DS



Quelle: Doyle & Cuthbert, OGC Document 98-061

Filling the gap at medium clients





Specific OGC Web Services for 3D visualization:

- ▶ **Web Terrain Service** WTS (now: Web Perspective View Service)
- ▶ **Web 3D Service** W3DS

Benefits of OGC conforming portrayal services

- ▶ **Standard interface** between clients and servers
 - Components / implementations are **replaceable**
 - **Easy integration** of visualization fct. in any (geo) application
- ▶ **Can be combined** with other OGC Web Services:
 - Catalog Services (Web Catalog Service WCAS)
 - Authorization & Access Control Services („AAA-Services“)
 - eCommerce Services (Web Pricing & Ordering Service WPOS)



User

Webbrowser

2D

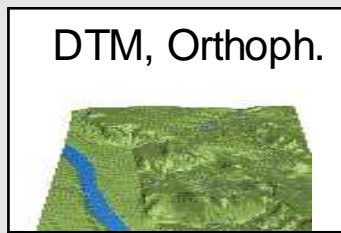
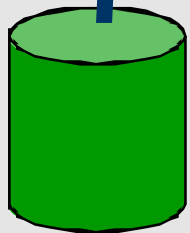
WTS

2D & 2,5D

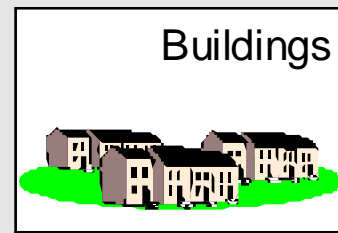
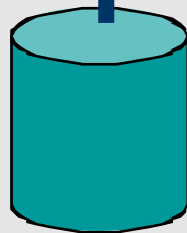
3D

2D

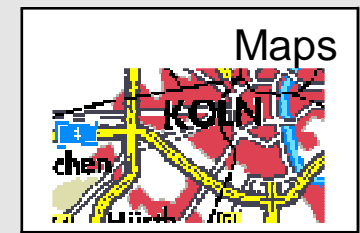
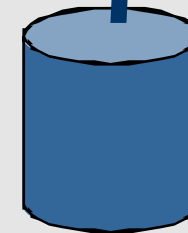
Web Coverage S.



Web Feature Serv.



Web Map Service

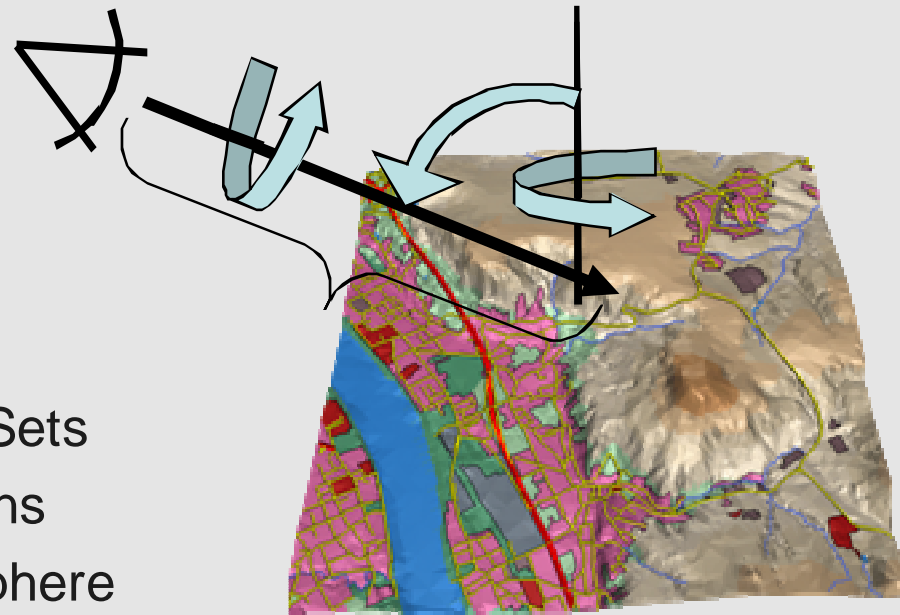


Full 3D portrayal service

- ▶ based on the Web Terrain Service, but not focused on terrain
- ▶ delivers 3D display elements (VRML97; X3D; KML; U3D etc.)
- ▶ generates 3D scenes with predefined initial viewpoint

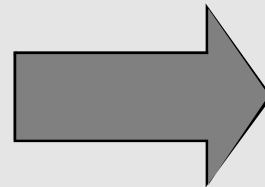
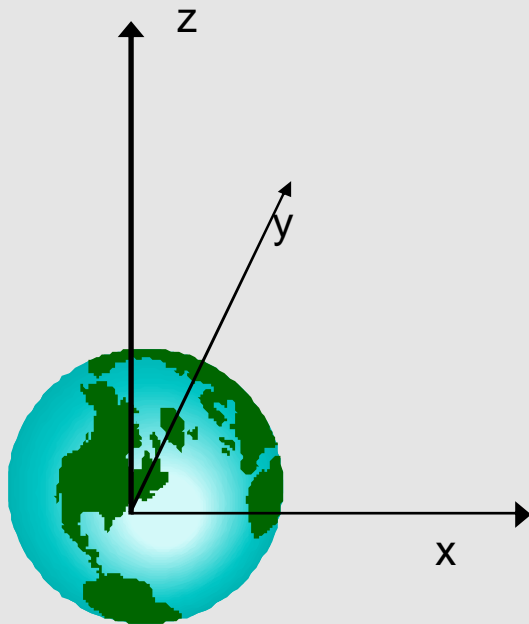
Parameters:

- ▶ Bounding box
- ▶ Viewing direction:
 - target point
 - distance
 - pitch, yaw, and roll angle
- ▶ “Object Layers“ resp. Feature Sets
- ▶ Date and time → Light conditions
- ▶ Background image and atmosphere

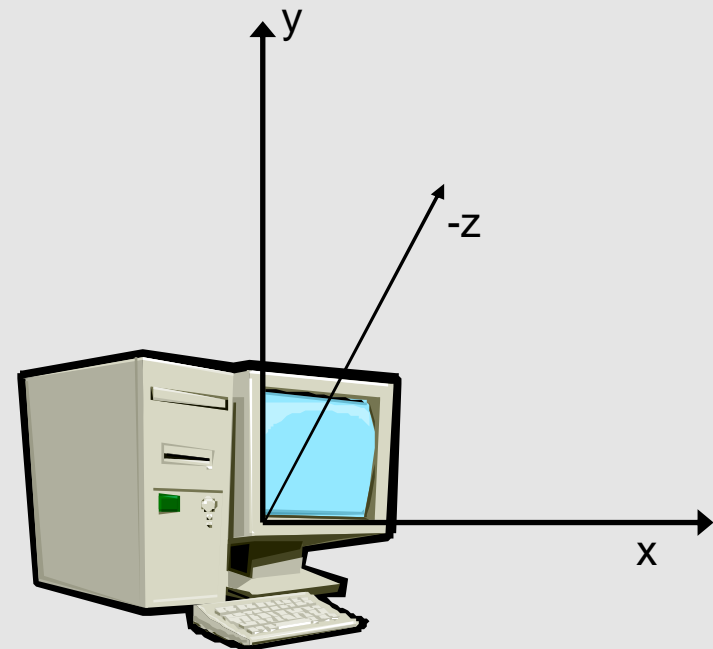


OGC Discussion Paper OGC 05-019 [2005]

Axis transformation is implicitly included: Real World => Computer graphics



$X \rightarrow X$
 $Y \rightarrow -Z$
 $Z \rightarrow Y$

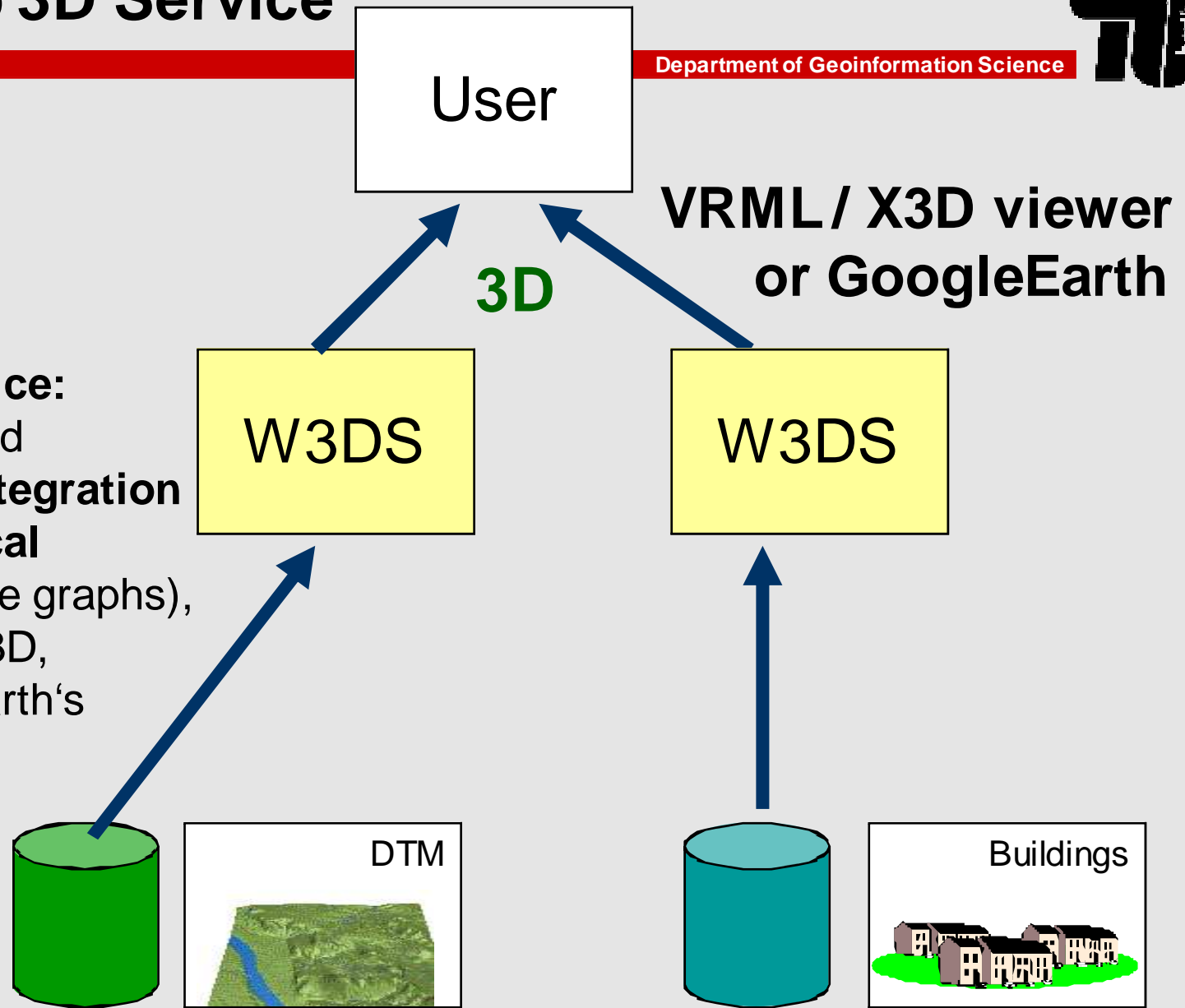


OGC Web 3D Service

Department of Geoinformation Science



Web 3D Service:
Generation and
client-side integration
of **3D graphical**
objects (scene graphs),
e.g. VRML, X3D,
and GoogleEarth's
KML



GetScene request using http GET



http://www.alkis-team-1.de/SgVrml/servlet/SG_W3DS?

SERVICE=W3DS&

VERSION=

REQUEST=

SRS=EP

FORMAT=

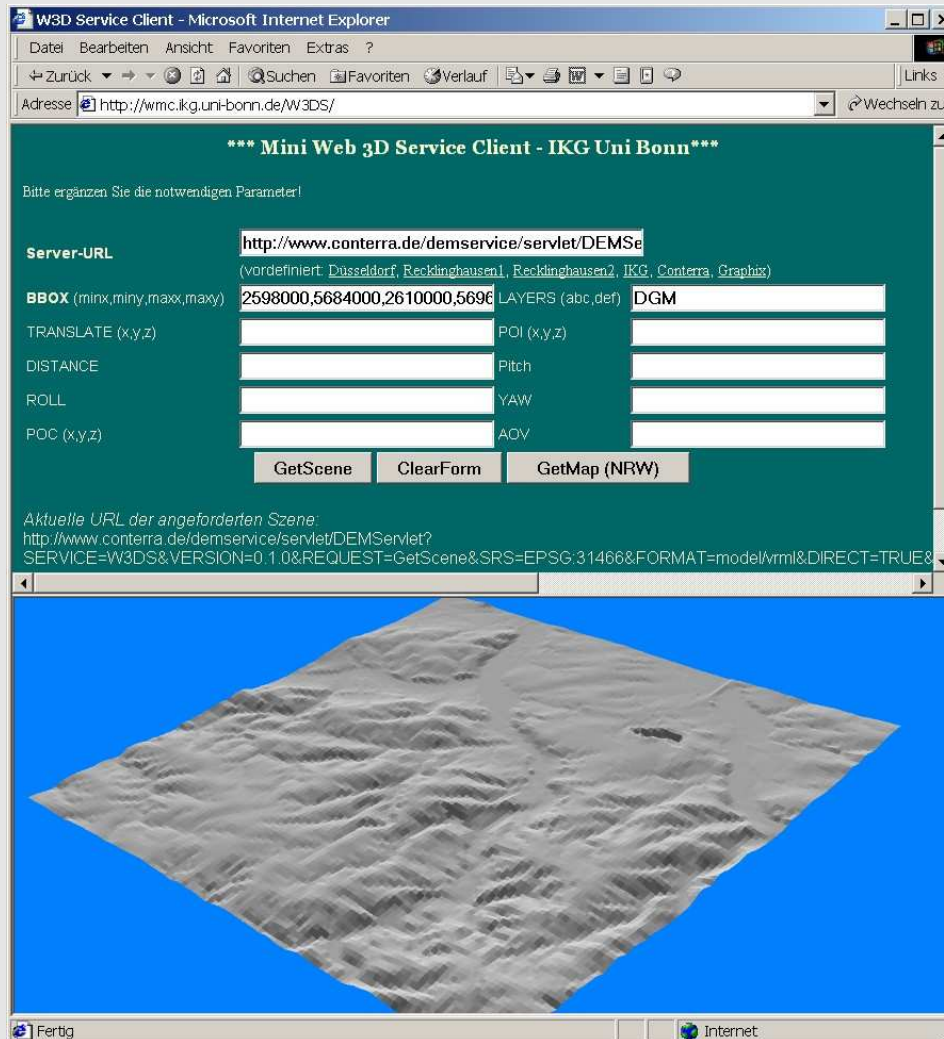
BBOX=2

LAYERS=

gives →→



Mini web client for W3DS



wmc.ikg.uni-bonn.de/W3DS

- simple web client (needs VRML plugin)
- for the evaluation of realized services
 - URLs of currently accessible servers are predefined
- parameter entry in a HTML form



- Important reasons for the success of the (2D) WMS:
 - **Combined visualization** of basis and thematic spatial information
 - by simple **overlay** of map images **within browser**
- **Ad hoc integration of 3D models in web browser?**
 - transient; no previous local download

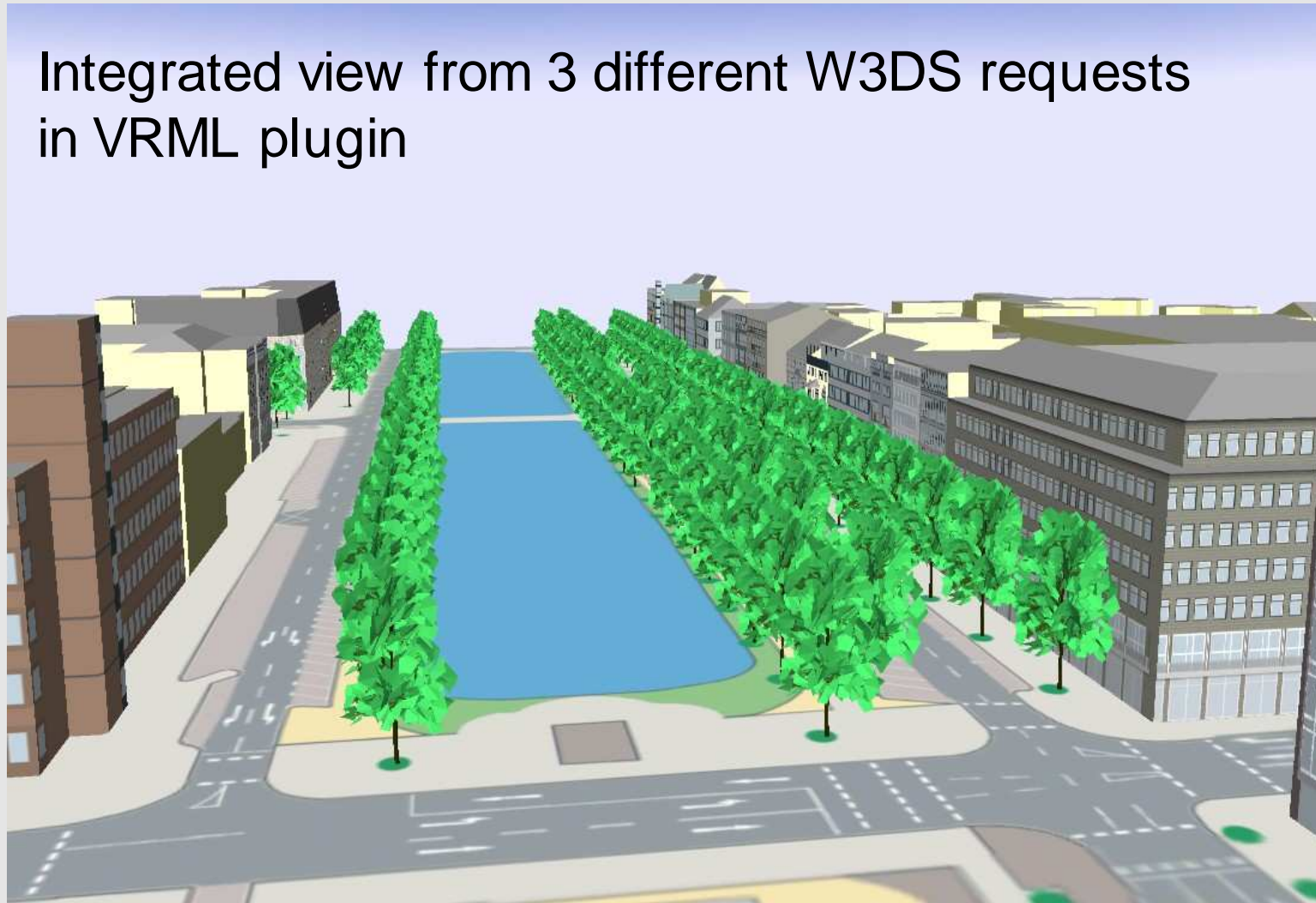
Realization using VRML/X3D inlining & Javascript:

```
#VRML V2.0 utf8
Transform{children[Inline{url "http://www.abc.de/..."}]}
Transform{children[Inline{url "http://my-W3DS.de..."}]}
```

Transient clientside Scene Integration



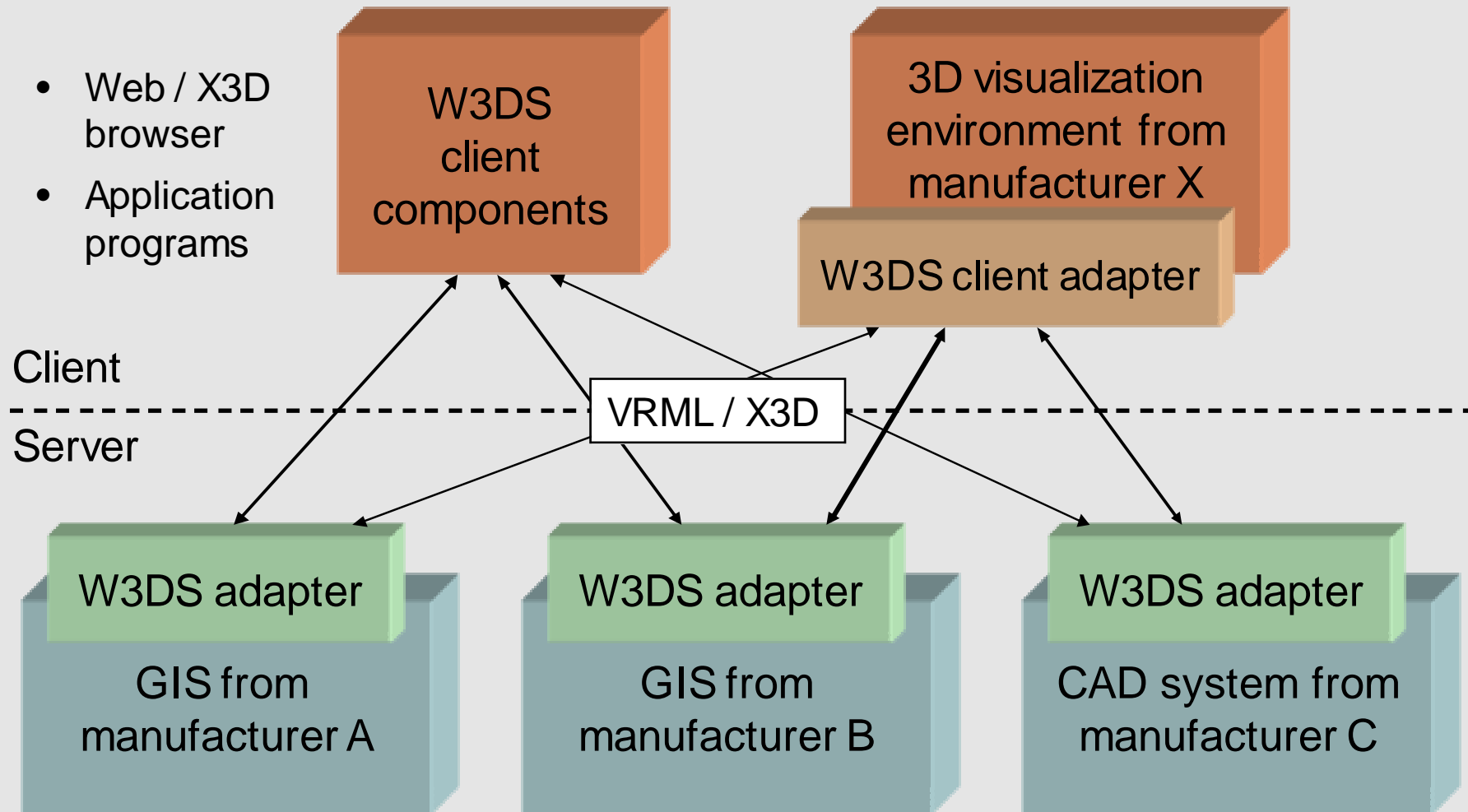
Integrated view from 3 different W3DS requests
in VRML plugin



Integration of existing systems



- Web / X3D browser
- Application programs



W3DS Client for Simulators

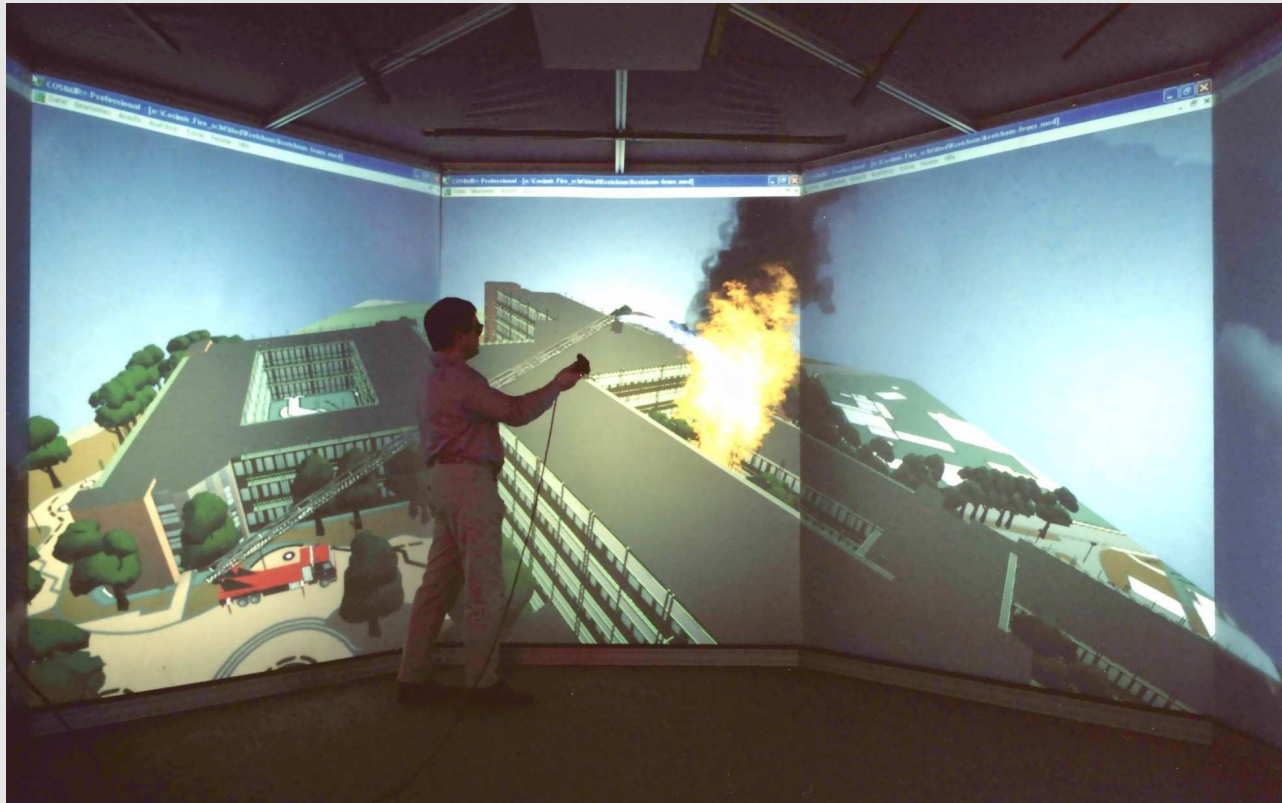


Foto: W. Herzberg

Usage of the
W3DS in a
3D application:

Interfacing with the
**Simulator
Application
COSIMIR** of the
Institute for
Robotics,
Univ. Dortmund

**Scenario:
Fire fighting**

Web 3D Service

- ▶ provides an easy way to **integrate 3D visualizations from different sources**
- ▶ Combines with OGC catalog service, DRM stuff etc.
- ▶ **no semantic information** for the 3D data **needed**
 - is independent from CityGML

CityGML is an

- ▶ **Urban Information Model** (Ontology; based on ISO 191xx)
- ▶ and **exchange format** for virtual 3D city and regional models (realised as GML3 Application Schema)
- ▶ Rich **information source for deriving 3D visualizations**