ArcGIS – An Open Platform

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ArcGIS Is an Open Platform

Flexible

API for JS
REST APIs
Runtime SDKs
FGDB API
Python API

Open Data

APIs

Open Source

Open Standards

Security
ISO
IHO
OGC
W3C
GeoJSON

Community

Open Street Map

Interoperable

Geonet
Partners

Customizable

Esri Leaflet
GitHub Projects (300+)
GDAL
App Templates
Open Format Specifications
CNTK
R
Python
pandas
scikit-learn

Successfully Integrated Into Thousands of Systems
Esri is playing an active role in ISO and OGC

- **Active Membership in**
  - ISO/TC 211 - International Organization for Standardization Technical Committee 211
  - OGC - Open Geospatial Consortium
  - W3C - World Wide Web Consortium
  - IHO - International Hydrographic Organization

- **ArcGIS Product Suite has a long list of OGC certifications**
  - 162 products
  - 437 standards implementations – 437 are currently compliant
  - 1st compliance certification – 23.12.1999
Open Standards across the ArcGIS system

DOMAIN DATA MODELS
- ISO LADM, ...
- IHO S-57 / S-100 series
- INSPIRE
- FGDC
- NENA
- ...

METADATA
- ISO 19115 / 19139
- FGDC CSDGM
- INSPIRE
- North Am. Profile
- Dublin Core
- ...

WEB SERVICES/APIs
- GeoServices REST
- ISO/OGC WFS, WMS, WMTS...
- OGC API Features, Tiles,...
- ISS
- ...

SECURITY
- Data Sovereignty
- Trust
- Identity
- ...

ENCODINGS
- JSON
- XML
- GML
- RDF
- ...

CATALOG & SEARCH
- DCAT
- DCAT-AP
- SEO practices
- CSW
- ...

ACCESSIBILITY
- WCAG
- W3C
- ...

Data & Metadata
Web Services & Metadata
Work with Partners
Open & Private Data
Hub Sites & Catalog
Maps & Apps

produce → publish → collaborate → share → use (& reuse)

ArcGIS Pro
ArcGIS Enterprise
ArcGIS Online
ArcGIS Hub Basic
ArcGIS Hub Premium
ISO LADM – Represented as Cadastral Fabric in ArcGIS
Content Providers Generating/Using I3S content
I3S – AI and Deep Learning….

• Currently Esri is heavily investing in R&D of AI and Deep Learning in GIS context
  - Automatic mesh segmentation of an Integrated Mesh Layer
  - Point cloud classification
  - …

• Provide tooling to create training datasets..

• Plug in GIS content easily into deep learning networks - TensorFlow or Pytorch frameworks
Action – Pluvial Flooding Information System

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Pluvial Flooding Information for Upper Austria

- Regional Government of Upper Austria
  - DORIS - GIS department

- EPZ - Elementarschaden Präventionszentrum
  - Center for Disaster Prevention
  - The EPZ addresses all meteorological natural hazards with a primary focus on hail and flash flooding in terms of prevention.
Flash Floods - Pluvial Flooding

Surface Runoff

- **Pluvial Flooding / Flash Floods**
  
  Also known as *surface runoff* is the flow of water occurring on the ground surface when excess rainwater, stormwater, meltwater, or other sources, can no longer sufficiently rapidly infiltrate in the soil.

- To be distinguished from fluvial and coastal flooding

https://www.land-oberoesterreich.gv.at/261441.htm
https://en.wikipedia.org/wiki/Surface_runoff
Fluvial Flooding Risk Information Map

a comprehensive and high-resolution map

- 2D hydraulic-model
- 1m resolution
- Areas with increased risk
- Basis for urban planning and actions
- Interesting data for insurances

- Data was created by EPZ for the local government with public-private partnership.
WMTS based System-Architecture

GIS Server (GeoServer)
Providing WMTS

Flash Flood Map
GeoTIFF
COG (Cloud Optimized GeoTIFF)
WMTS based System-Architecture

EPZ - Infrastructure

GIS Server (GeoServer) Providing WMTS

Flash Flood Map
GeoTIFF
COG (Cloud Optimized GeoTIFF)

doris - Infrastructure

Public available webclient
Low resolution, 1:10.000

Internal clients
High resolution, professional expertise required

GIS Server (ArcGIS Enterprise)
Government data
WMTS based System-Architecture

GIS Server Providing WMTS Flash Flood Map GeoTIFF COG (Cloud Optimized GeoTIFF)

**EBZ - Infrastructure**

- **Public available webclient**
  Low resolution, 1:10,000

- **Internal clients**
  High resolution, professional expertise required

**doris - Infrastructure**

- GIS Server (ArcGIS Enterprise)
- Government data

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WMTS based System-Architecture

**GIS Server**
Providing WMTS Flash Flood Map GeoTIFF COG (Cloud Optimized GeoTIFF)

**EBZ - Infrastructure**
- **Public available webclient**
  - Low resolution, 1:10,000

**Internal clients**
- **High resolution, professional expertise required**

**doris - Infrastructure**
- **GIS Server (ArcGIS Enterprise)**
  - Government data
WMTS based System-Architecture

EPZ – Cloud – Infrastructure

- GIS Server (GeoServer)
  - Providing WMTS
- Flash Flood Map
  - GeoTIFF
  - COG (Cloud Optimized GeoTIFF)

- Secure connection

IP-secured WMTS

Webclient for Business Customers
- with costs
- High resolution for specific areas
- professional expertise required

EPZ – Infrastructure

Public available webclient
- Low resolution, €10.000

doris - Infrastructure

- Internal clients
  - High resolution, professional expertise required

GIS Server (ArcGIS Enterprise)
- Government data