USDA Geospatial Vision/Strategy And The New Departmental Regulation On Geospatial Management

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Envisioning New Roles and Responsibilities (Part of the Future Architecture—Evolution of Technology)

- We Currently Are Geospatial Content Managers
  - FSA and NRCS Field Offices creating and managing the CLU and Easement layers
  - FSA and NRCS National Offices managing NRI and NAIP imagery
  - RD managing the many “rural” definition layers for program eligibility
- We Should Focus On Being Geospatial Content Distributors
  - How do we optimize the way in which data is consumed?
  - Do we understand who the consumers are?
  - How can we best meet the Presidential Open Data Initiative?
- Our Goal Should Be To Mature Content Management “and” Distribution
  - Metadata management
  - Open data (distribution) management (**Searchable/Discoverable > Accessible > Usable**)
- What is the geospatial technology doing to help us get there?

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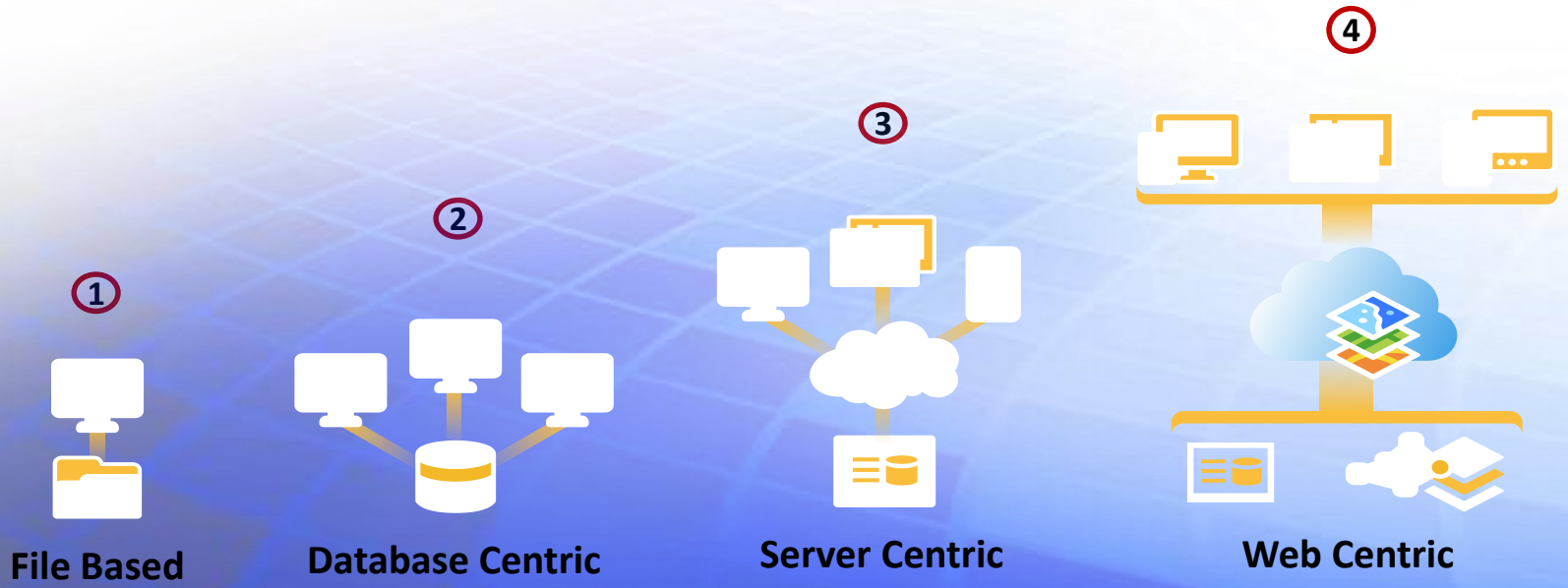
Multiple Implementation Patterns

Leveraging Common Computing Architecture



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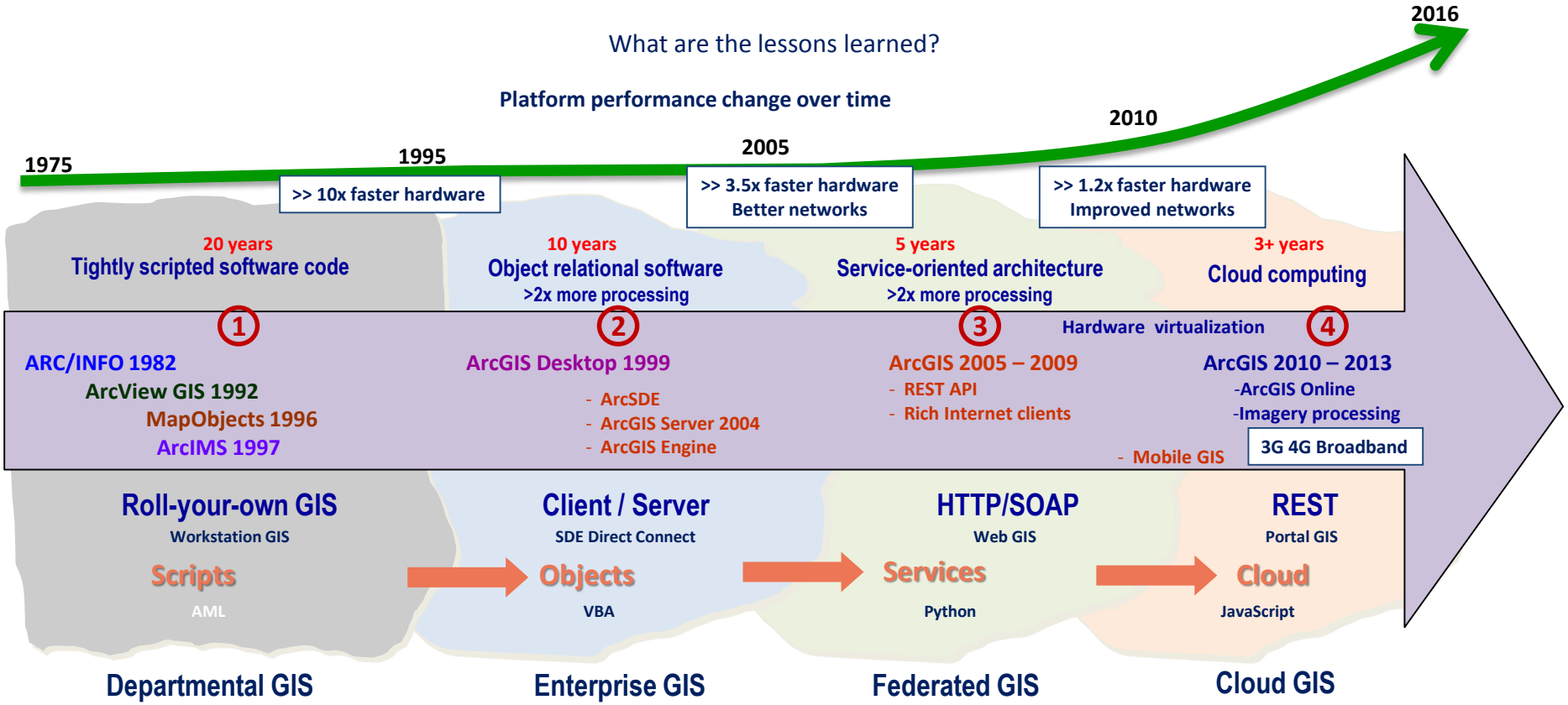
GIS Software Evolution

What are the lessons learned?



…Technology drives innovation

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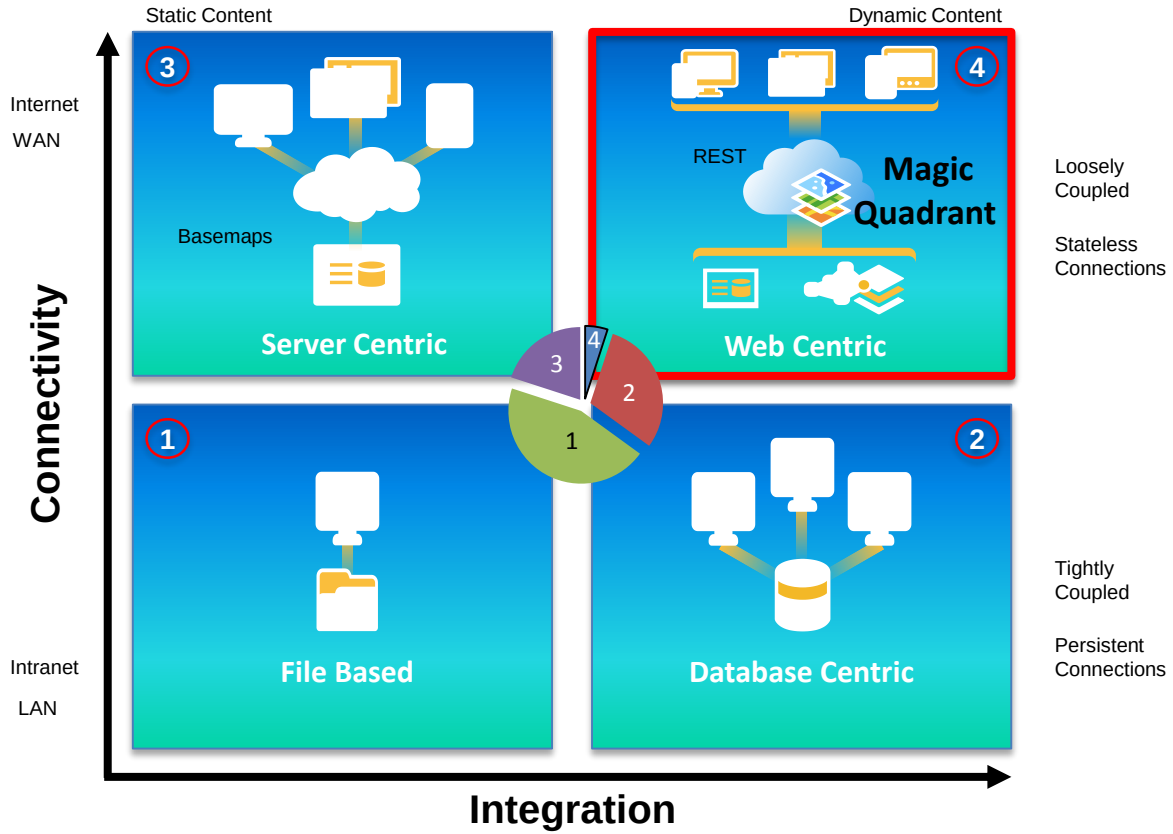
“To Be” Architecture



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Architecture in Each Quadrant

Wide Area Network

Local Area Network

3 Enterprise Data Center

- Web Servers
- Enterprise Data Center
  - Physical & Virtual Servers
  - Physical & Virtual Storage
  - General & Storage Networks
- DMZ
- Load-balancing
- Distributed WAN

4 Cloud Data Center

- Cloud Services (All Virtualized)
  - SaaS
  - PaaS
  - IaaS
- Data Stored as Objects
- Elasticity
- Site Redundancy
- Inherent Failover & DR

1 Single Workstation

- Desktops / Laptops
- Video Cards
- Local Disk Drives
- External Storage
  - Thumb Drives
  - CD ROM
  - DVD
  - Data Bricks (External Drives)

2 Multi-User Client/Server

- Database Servers
- Shared Storage
  - File Server
  - Hieratical File Systems
  - NAS (Network Attached Storage)
  - SAN (Storage Area Network)
- Archive Systems
  - Tape
  - Jukebox

GIS Application Types in Each Quadrant

Wide Area Network

Local Area Network

3 Custom Web Apps

- *ArcIMS (Soon to be retired)*
- ArcGIS Server
- JavaScript (HTML5) Apps
- RIA – Rich Internet Apps
  - ✓ Silverlight / Flex
- WPF (.NET) Apps
- ADF (No longer supported)

4 ArcGIS Online

ArcGIS Online for Organizations

Portal

- ✓ On Premises (Behind the Firewall)
- ✓ Private Cloud (e.g. Amazon, GovCloud)
- ✓ ArcGIS Online (Organizations)

- Templates (e.g. Story Maps)
- App Builder (Custom/Configure)
- App Studio (Qt) – Native Mobile Apps
  - ✓ iOS, Android

1 Desktop

- ArcMap
  - ✓ ArcView
  - ✓ ArcEditor
  - ✓ ArcInfo
- ArcGIS Pro
- Imagery Analysis (ELT)
  - ✓ ERDAS, ENVI, RemoteView, etc.

2 Client / Server

- ArcSDE – Spatial Data Engine
- SQL Server
- Oracle
- PostgreSQL
- Geometric Network
- Imagery Services

GIS Data Types in Each Quadrant

Wide Area Network

Local Area Network

3 ArcGIS Server Services

- Map (Feature, OGC) services
- Geocode service
- Geodata service (GDB Replication Sync)
- GeoEvent service
- Stream service (Real-time data)
- Geoprocessing (GP) service
- Globe service
- Image service (4band-MS, Elev., DSM, Hillshade)
- Search service
- Workflow Manager service

4 Cloud Services

- Amazon (IaaS)
  - S3 Storage
- MS Azure (PaaS)
  - Azure SQL
- Feature Services (Azure SQL)
- Feature Collection (S3)
- Tile Feature Service (S3)
- Tile Service (S3)
- Basemap (S3)

1 Files

- Shapefile (.shp)
- PGDB – Personal Geodatabase
- FGDB – File-based Geodatabase
- Layer Package
- Map Package
- Imagery Scenes (.tiff, .sid, DOQQ)
- LiDAR (.las)

2 Multi-user Systems

- ArcSDE – Spatial Data Engine
- RDBMS (SQL Server, Oracle, PostgreSQL)
- Mosaic Dataset (Imagery Library)

The Question:

How do we leverage the changes in technology for how we do business today?

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Step 1:
Creation of the Departmental Regulation (DR) on Enterprise Geospatial Data Management

- GAO Audit in February 2015 http://www.gao.gov/assets/670/668494.pdf
  - Calls out the management maturity of geospatial products in the Fed landscape
  - Calls out OMB for not stressing management maturity in the Fed landscape
  - Calls out the participation in moving geospatial products to an open market space where things can be searchable, discoverable, and usable
  - Calls out the USDA for not having policy on geospatial metadata management (page 48)

- The DR supplements USDA Digital Government, Open Government, Open Data, and data lifecycle management-related policies and gives particular focus on geospatial being a participant in all of these activities. Also in line with the future Geospatial Enterprise Architecture for the Department (in draft)

- Currently, there is no enterprise portfolio view of geospatial within USDA—this is changing

Scope of the DR

- The DR does not apply to every geodata set in the Department

- Applies to geospatial Authoritative Data Sets (ADSs): From the Department of Defense, a recognized or official data production source with a designated mission statement or source/product to publish reliable and accurate data for subsequent use by customers. An authoritative data source may be the functional combination of multiple, separate data sources. ADS's are not interim products leading to a final published ADS. (DoDD8320.03, Unique Identification (UID) Standards for a Net-Centric Department of Defense, March 23, 2007

- Applies to the National Geospatial Data Assets, the Office of Management and Budget (OMB) A-16 data themes, defined for the USDA by the Federal Geographic Data Committee (FGDC).

- This is a return to a concept of treating **"geodata as an Departmental asset"** and aligns roles and responsibilities around the management of geodata.

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Step 2

- Measure the maturity of the management of the data
- Will apply the survey to every ADS beyond the A-16 USDA data theme layers already being measured within the FGDC using the same methodology
- Will be developing a culture of understanding around “easy access” and/or plug-n-play
  - Will require different work flows
  - Will require new roles and responsibilities
  - Will be built into the annual portfolio reviews
- This is a time and cultural issue

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Step 3

- Annual Portfolio Reviews already happen so leverage this activity
- Ask for the amount of DME and O&M expenditures
- Ask for a list of the ADSs
- Measure the management maturity on an annual basis and prioritize where improvements can be made
- This is a time and cultural issue so the behavior of mature management
- Use the next year's Agency Portfolio Review to measure progress

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Step 3 (Continued)

Agency	Total Geospatial Spend in 2016	Percent Spend Compared to Overall Spend
FSA	$25,726,836	44.4277%
NRCS/SCS	$6,869,212	11.8625%
USFS	$7,303,045	12.6116%
APHIS	$489,147	0.8447%
ARS	$789,132	1.3628%
RD	$979,068	1.6908%
RMA	$379,403	0.6552%
NASS	$1,165,496	2.0127%
FAS	$7,471,603	12.9027%
ERS	$57,224	0.0988%
FSIS	$7,115	0.0123%
OCE	$22,212	0.0384%
AMS	$7,296	0.0126%
CSREES/NIFA	$1,235	0.0021%
DA/OHSEC	$934	0.0016%
FNS	$137,774	0.2379%
OCIO	$6,500,222	11.2252%
OIG	$222	0.0004%
	$57,907,175	100.0000%

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Step 4

- Annual Enterprise Architecture Repository (EAR) reviews
- Align applications with systems
- Will provide tighter connection to dollars spent on programs that sometimes don’t get counted in the overall spend

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Step 5: The New World of the Esri Platform

- ArcGIS Online for Organizations
  - Cloud Service
  - Is automatically part of an agencies toolset due to ELA
  - Open to anybody to find data and do analysis if “shared” correctly
  - Can publish feature services with a click of a button

- Portal for ArcGIS
  - On Premises
  - Cloud Services
  - Limited to who can see the data and limited to what data you can find
  - Can meet higher security needs
  - Is automatically part of an agencies toolset due to ELA

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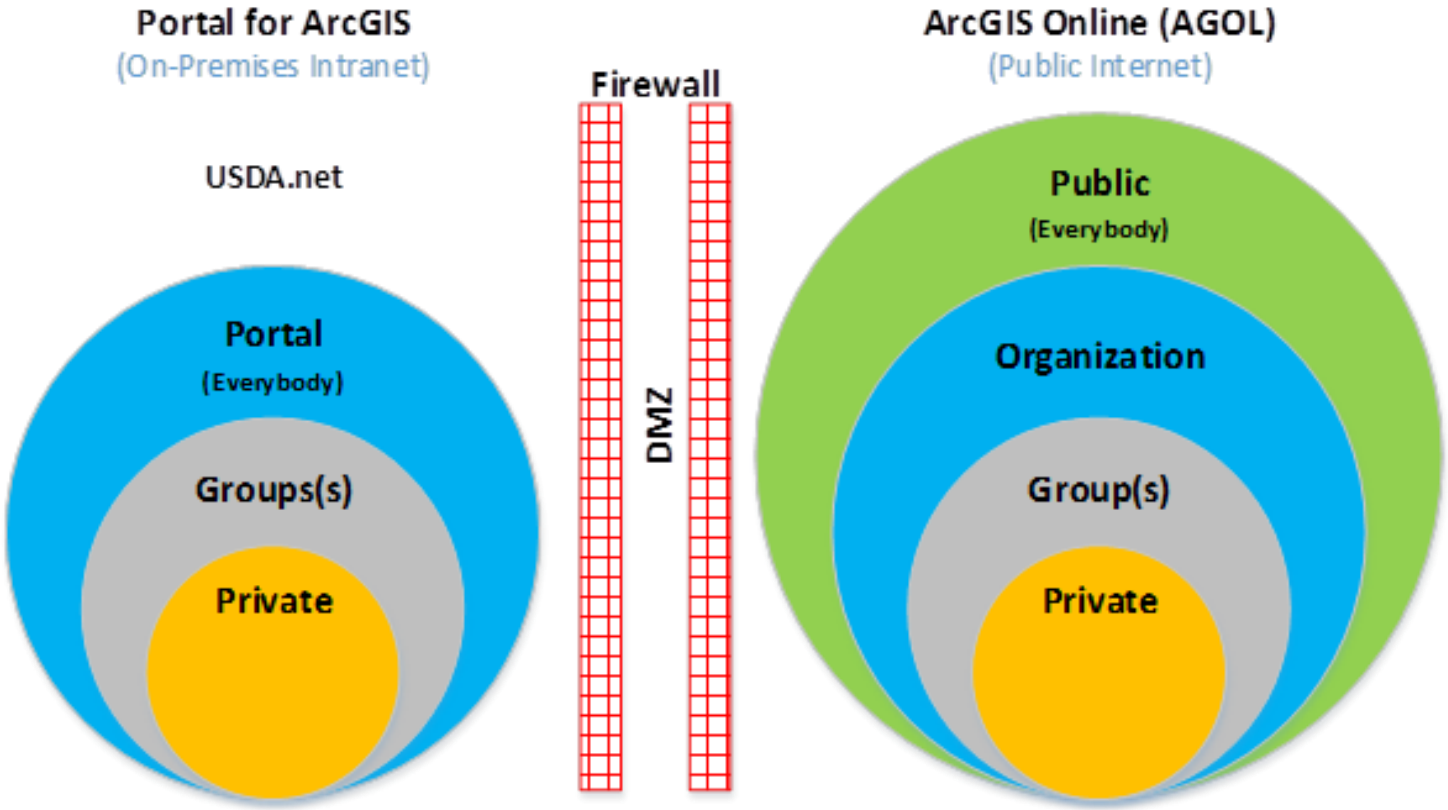
Portal for ArcGIS vs. ArcGIS Online



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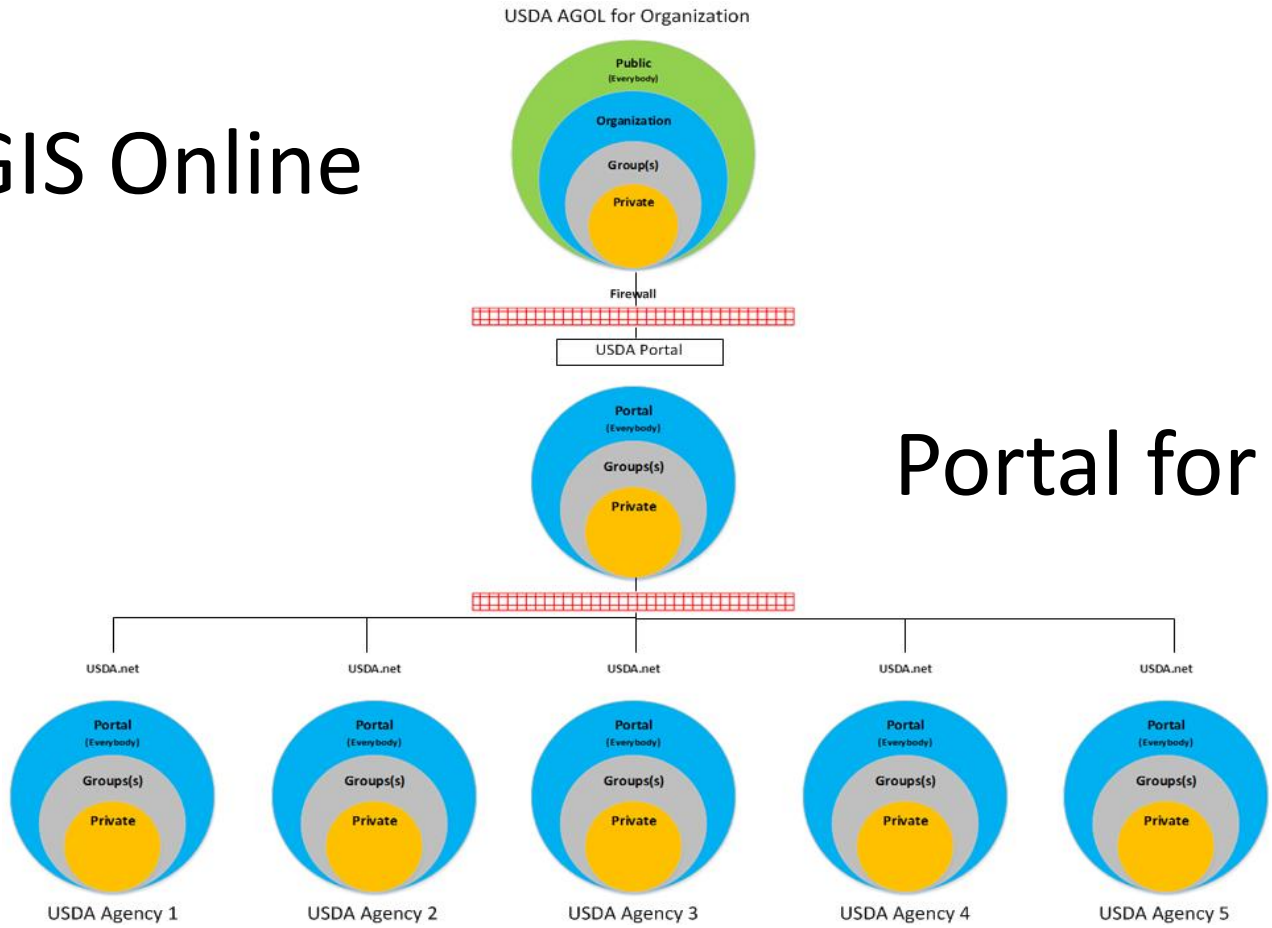
ArcGIS Online



Portal for ArcGIS

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Path to the “To-Be” Architecture—The Strategy

1. Analyze and Maintain the Enterprise Architecture Repository (EAR)
2. Articulate the “To-Be” Architecture Narrative
3. Have geospatial be an active part of the annual portfolio reviews
4. Integrate the EGDM Policy into USDA Culture
5. Have the Vertical Agencies engaged in the Maturity Survey with ADSs
6. Build out the Portal and AGOL Architecture
   --certify and register geospatial data for ADS’s and A-16 themes
   --posts any other data that might have downstream value

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Years of Follow-on!!

Questions

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