ArcGIS Online: Best Practices for High-Demand Web Applications

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Agenda

• Communicating with Maps
• Who do you build your apps for?
• Layer Types
• Scalability and Response Caching
• Visualization Strategies
• Sharing with the Public
Communication with Maps
Mapping on the Web

- Web Mapping Application
- Static Image

- Interactive (they do something)
- Easily Accessible by Audience on any device
- Integrated into existing media
- Create Spatial Dialog with Audience
- Fast to Build and Distribute
Interactive Web App Architecture

Layers → Web Map → Web App
Who do you build your Web Apps for?
Consider your Audience

- A few select viewers
- GIS Analysts
- The entire world
- Local citizens
- Emergency Responders
What is the intended experience

• What is being communicated?
• What data and visualization are important?
• Do they need to have a login?
• What is the desired user interaction
  - Pop-ups
  - Routing
  - Compare data
  - Change basemaps
  - Explore data
What is the Performance expectation?

• How long should it take for a layer to load?
  - Immediate
  - 3 seconds
  - 10 seconds

• How long should a user wait for results?
  - Immediate
  - 10 seconds
  - It depends

• Does the user need to navigate to a new application or is it embedded in familiar media like a website?
Apps in High Demand (Viral)

Assumptions:

Audience: The entire world

Performance: App loads quickly (no more than 3 seconds)

All components need to withstand up to 1000 req/s

Functionality: User can figure out tools without instructions

No more than 3 clicks to complete interaction
Web Mapping Application Considerations

Functionality

Performance

Usability
Design Choice

Functionality

Usability
Performance Choice
Layer Types
Tile Layers

• Tile Layers (Raster)
  - Always optimal if data isn’t changing frequently
  - Tiles can be generated automatically, efficiently creating new tiles when data is updated or a new area is requested.

• Tile Layers (Vector)
  - Support custom styling
  - Great for offline mobile workflows
Hosted Tile Layers – Best Practices

- Use when drawing complex geometry is not responding fast enough
- Publish from hosted feature layer or pre-creating a tile package
- Set desired symbology prior to publishing
- Choose to create tiles automatically
- Enable pop-ups using a feature layer as source data
Demo: Hosted Tile Layers
Feature Layers

- **Feature layers (Hosted)**
  - Supports editing, Visualization and can be used as input for analysis
  - Support feature layers views that allow different layers to be created from the same dataset
  - Hosted in the ArcGIS Online Cloud
  - Can be source data for tile layers

- **Feature layers**
  - Layers drawn from features hosted from a variety of sources including ArcGIS Enterprise feature layers, map layers and files.
  - Can support editing, display and can be used as input for analysis

- **Feature collections (Map Notes)**
  - Can be used for small datasets, where mapping features can be stored as text. (< 1,000 features)
  - Easy to create for simple mapping

- **Combination**
Feature Layers – Best Practices

- Publish public layers to ArcGIS Online (Let ArcGIS Online manage the infrastructure)
- Ensure that **Editing is Disabled** on the layer, even if there is no editing tool in your App
- Use Feature Layer Views where appropriate
ArcGIS Online Scalability: Tile queries and response caching

- ArcGIS Online Scales to meet demand
- Queries to large datasets are sent as tiled requests whose responses can be cached
- Response caching levels:
  - Browser cache (client-side)
  - Content Delivery Network cache
  - Feature tile cache (server-side)
Public VS. Private Response Caching
Editing Data for Public Layers

- **Crowdsourcing/ Citizen Science**
  - Set editing capabilities (add only)
  - Have a curation process
  - Hide identifying information in public view

- **Update Public Layers**
  - Private Editable Layer
  - Public Display Layer
  - Any edits invalidate response cache
Demo: Hosted Feature Layer View
Strategies for showing large amounts of data

• Filter
• Aggregate
• Visibility ranges
• Generalize
• Tile layers
• Cluster
Sharing with the Public

• Subscription and Premium Content
• App and source data
Best Practices for Layers under High Demand

- Think about your map’s audience and purpose
- Choose the right layer types
- Optimize feature layers for server-side response caching and editing workflows
- Get creative with visualization techniques
Resources

• Blogs:
  - https://blogs.esri.com/esri/arcgis/2017/03/02/best-practices-for-high-demand-viral-apps/
• Subscribe to RSS feed:
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