Best Practices for Publishing ArcGIS Online and ArcGIS Enterprise Services

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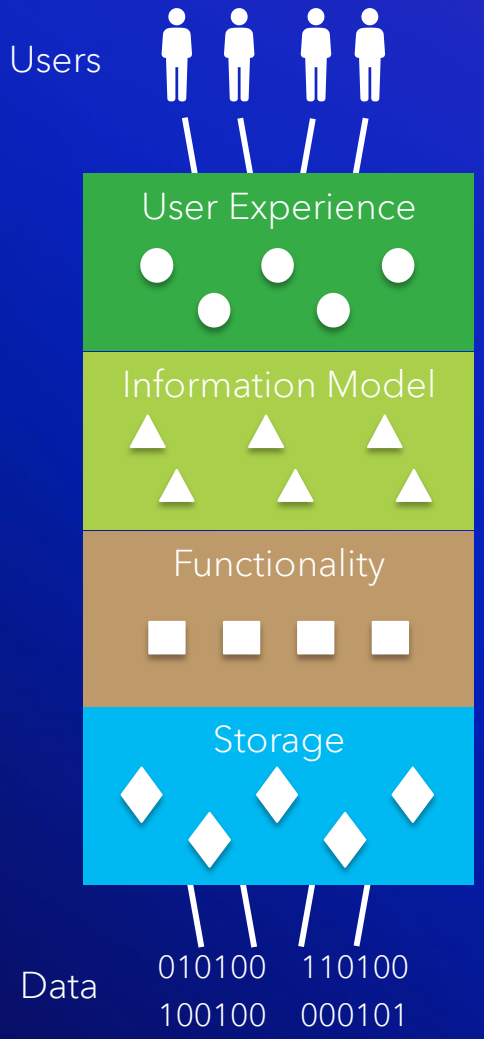
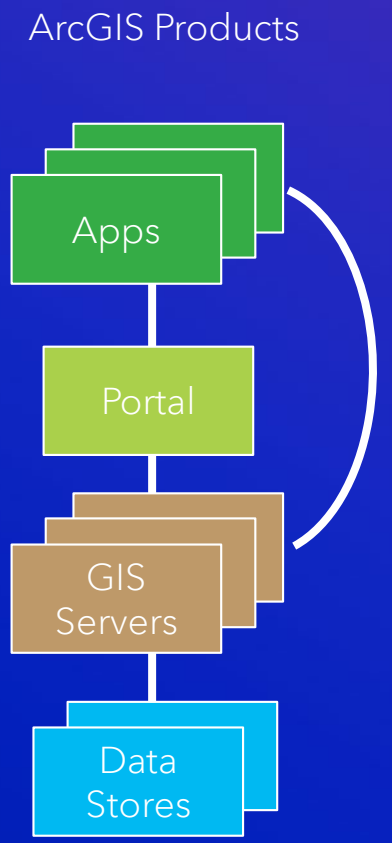
Moderator: Witt Mathot

2021 ESRI FEDERAL GIS CONFERENCE

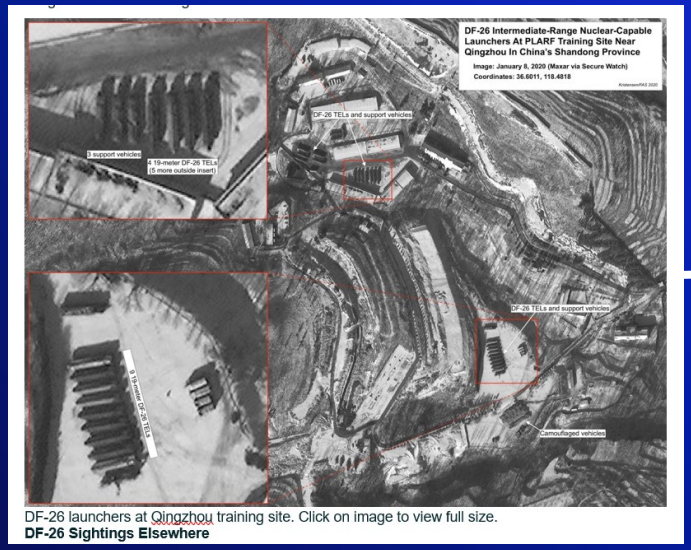
Best Practice Theme #1: Technical Foundation

Conceptual components



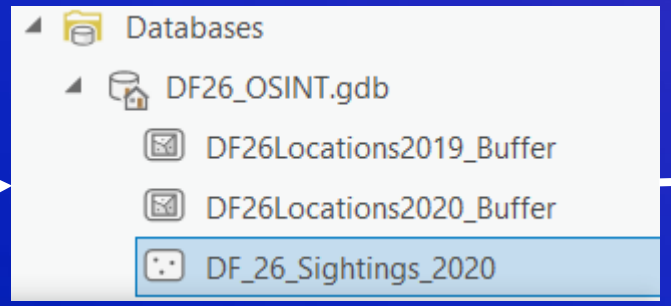


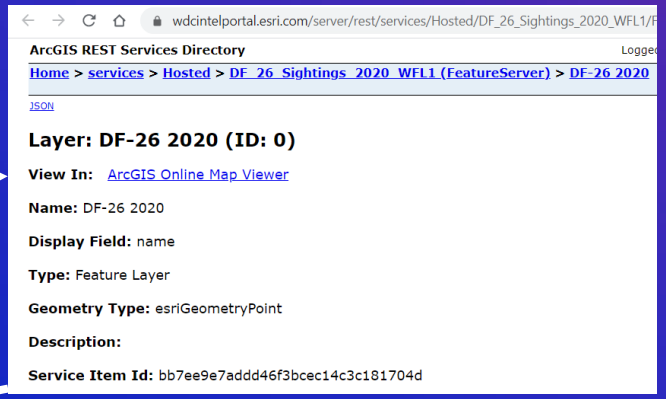
Real world example

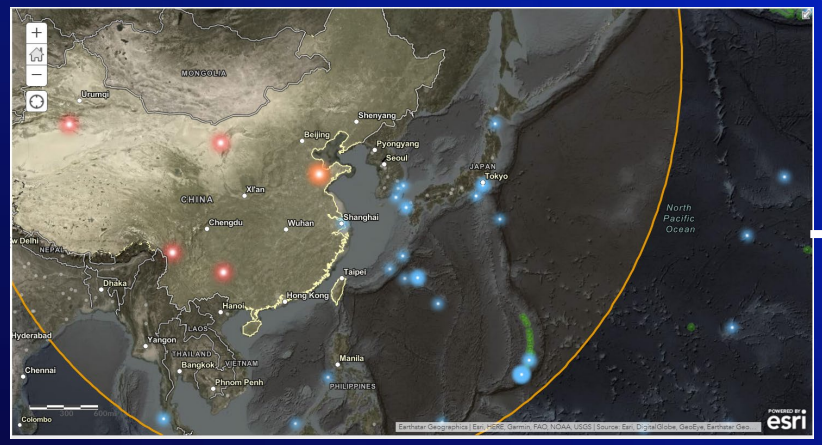


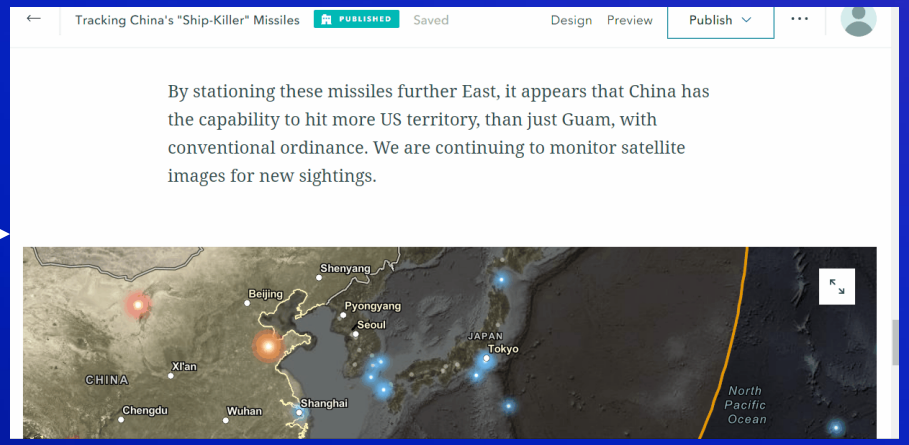
DF-26 launchers at Qingzhou training site. Click on image to view full size.

DF-26 Sightings Elsewhere

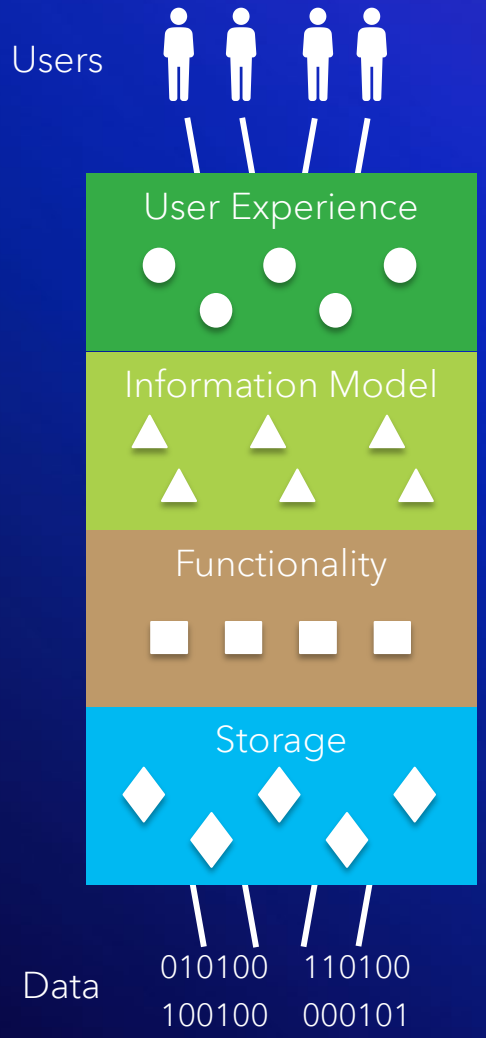


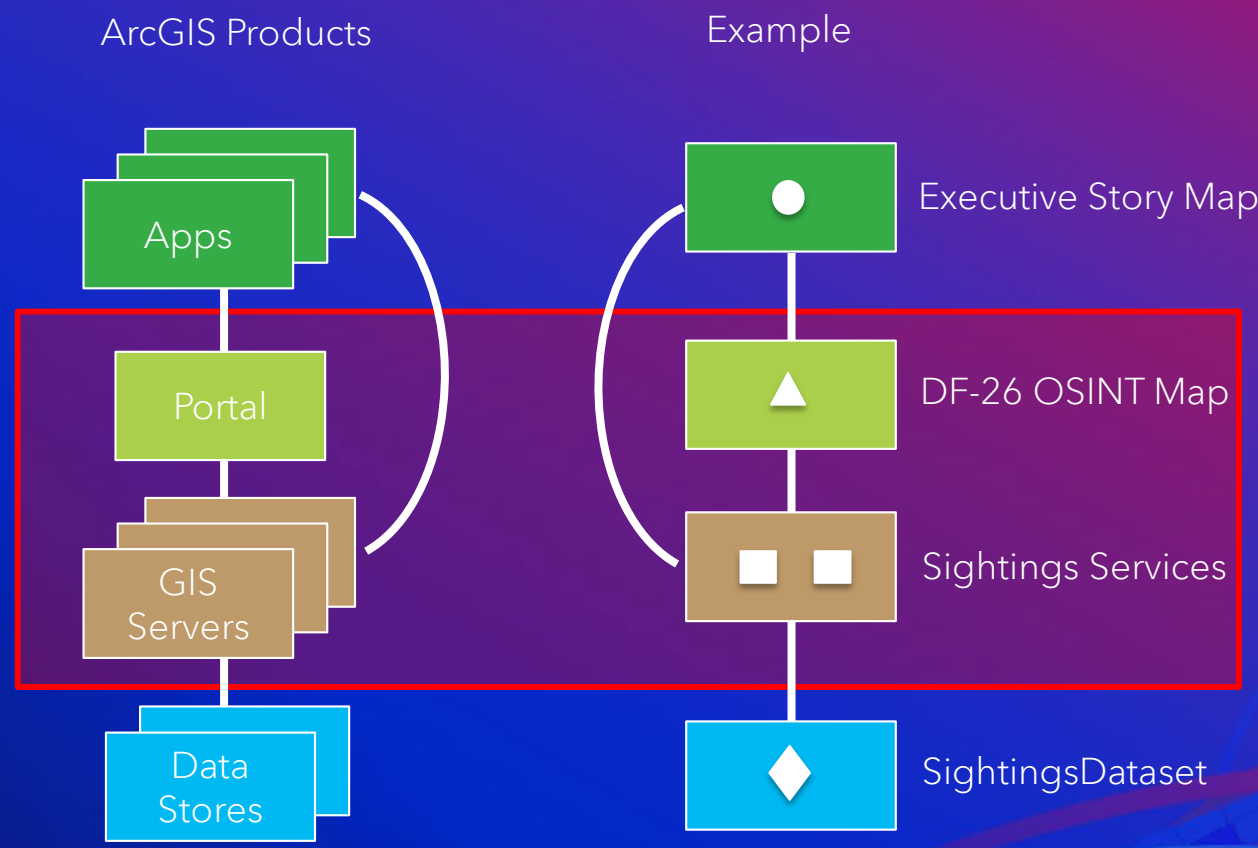






Conceptual components

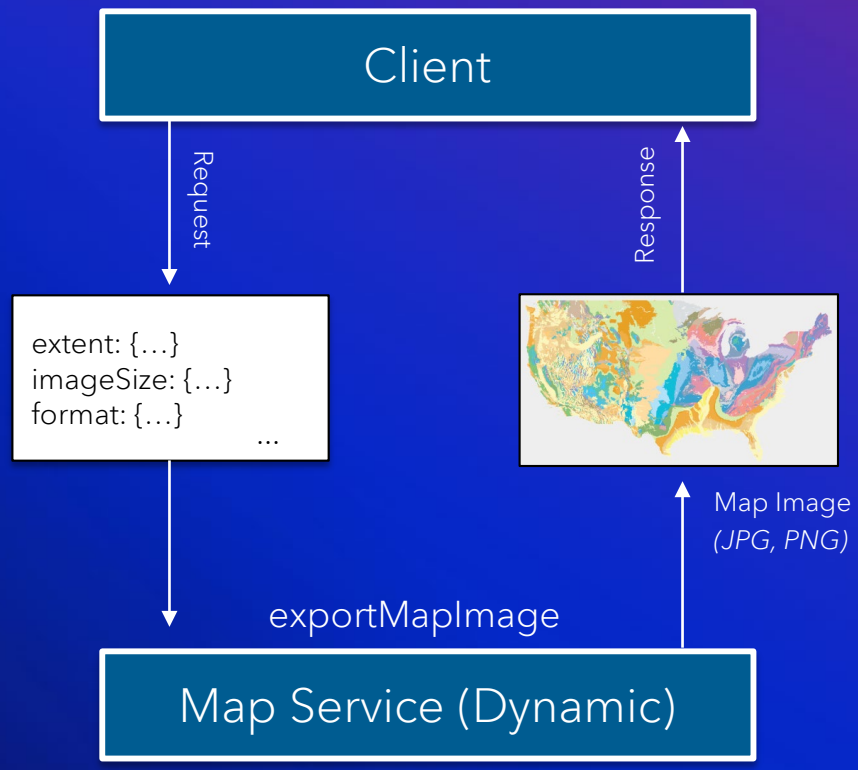




Types of services

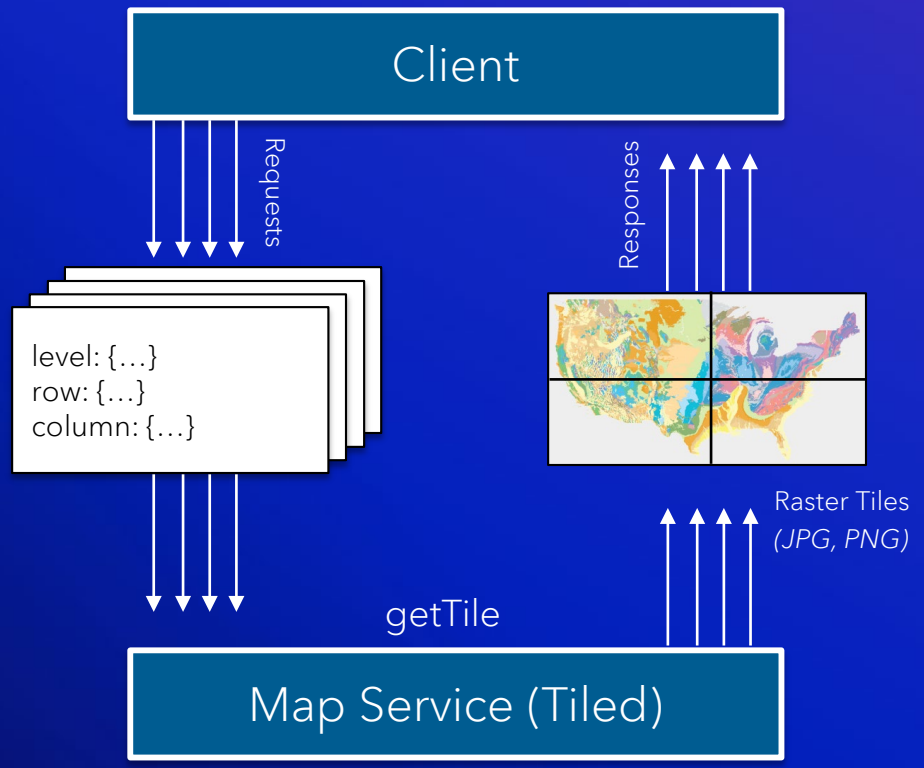
- Map Services (Dynamic)
- Map Services (Tiled)
- Vector Tile Services
- Feature Services
- Image Services
- Scene Services
- Stream Services
- Geocode Services
- Version Management Services
- Geometry Services
- Geoprocessing Services
- Network Analyst Services
- Geodata Services
- Workflow Manager, Maritime, Schematics …

Map Service (Dynamic)



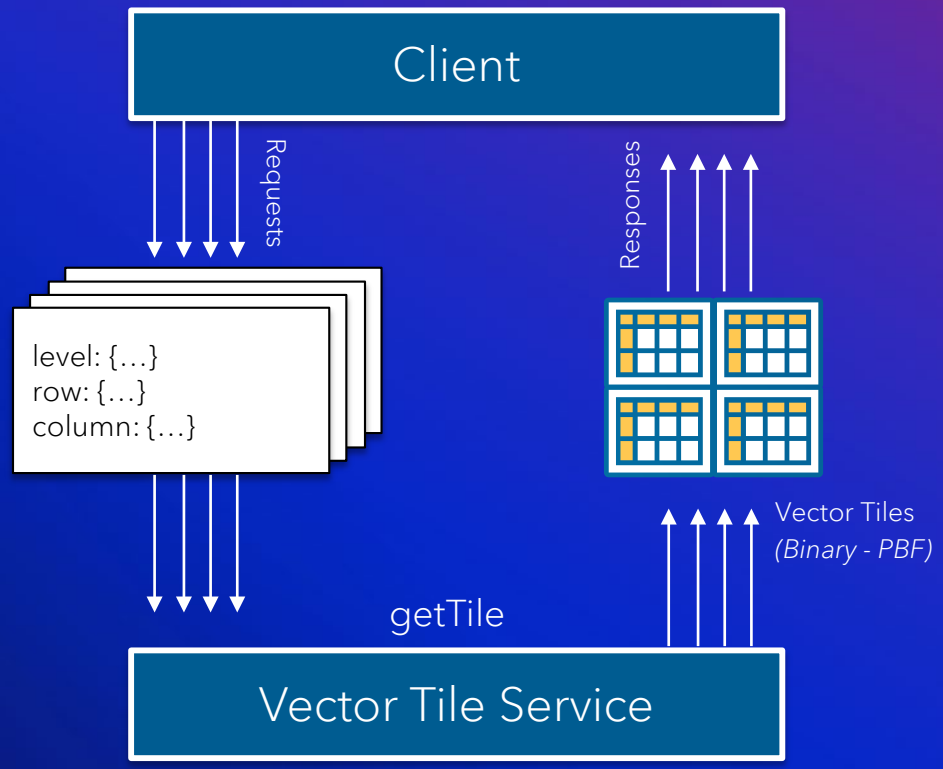
Best Practice Alert: The failsafe option for complex, dynamic data … especially on constrained networks

Map Service (Tiled or Cached)



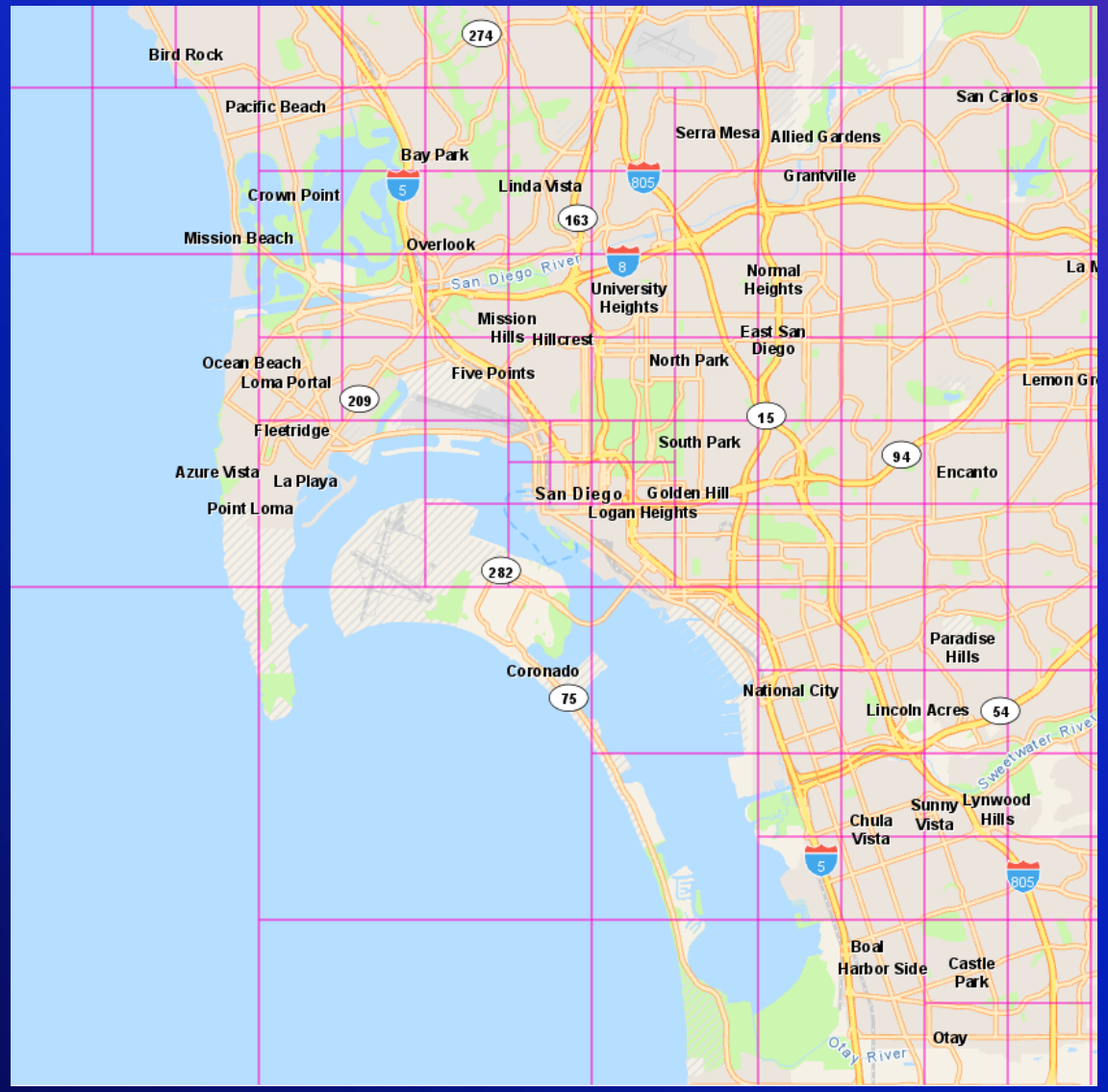
Best Practice Alert: Proven option for complex, static data with high performance needs

Vector Tile Service

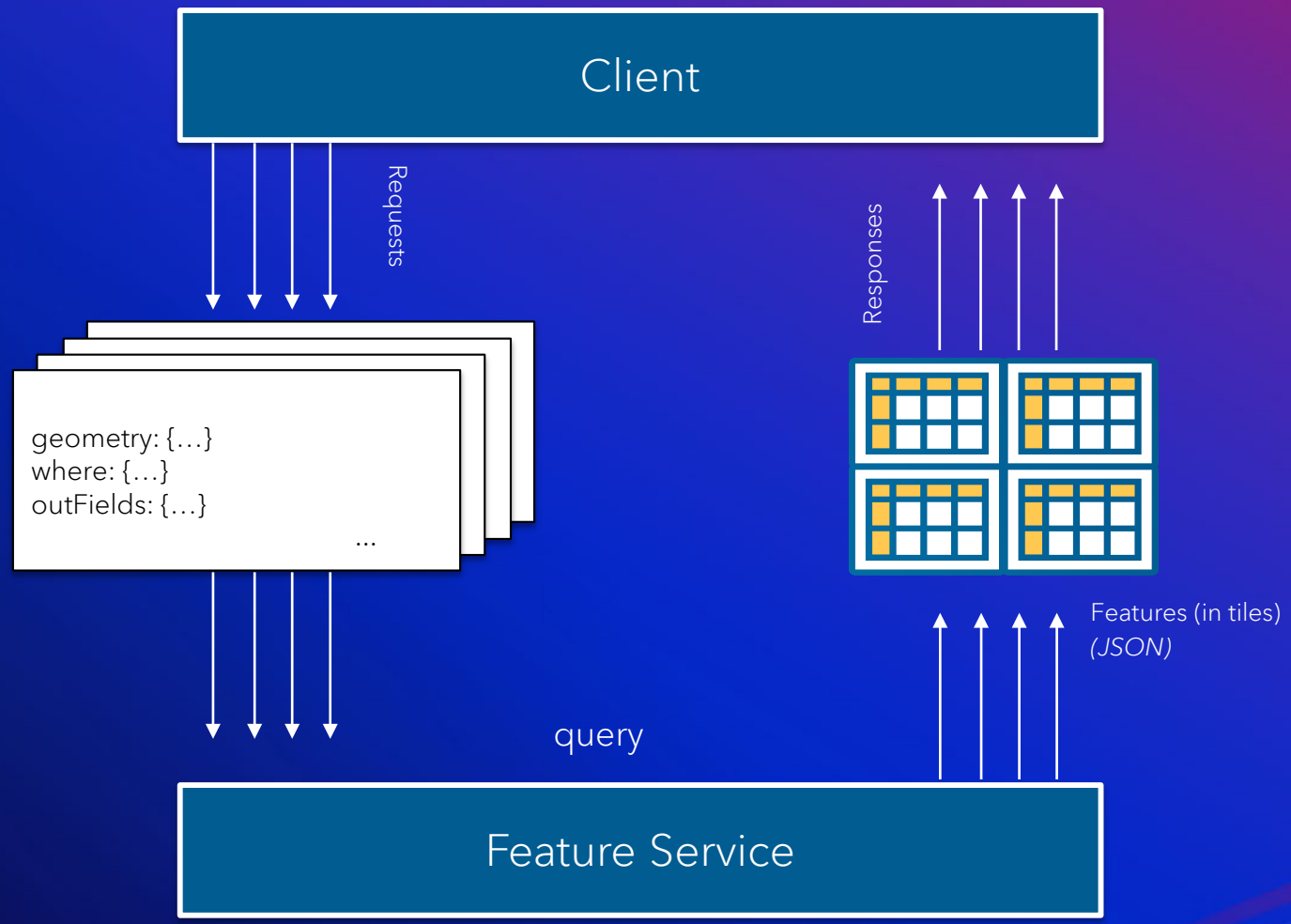


Best Practice Alert: Great alternative to tiled map services when visualization is the main purpose

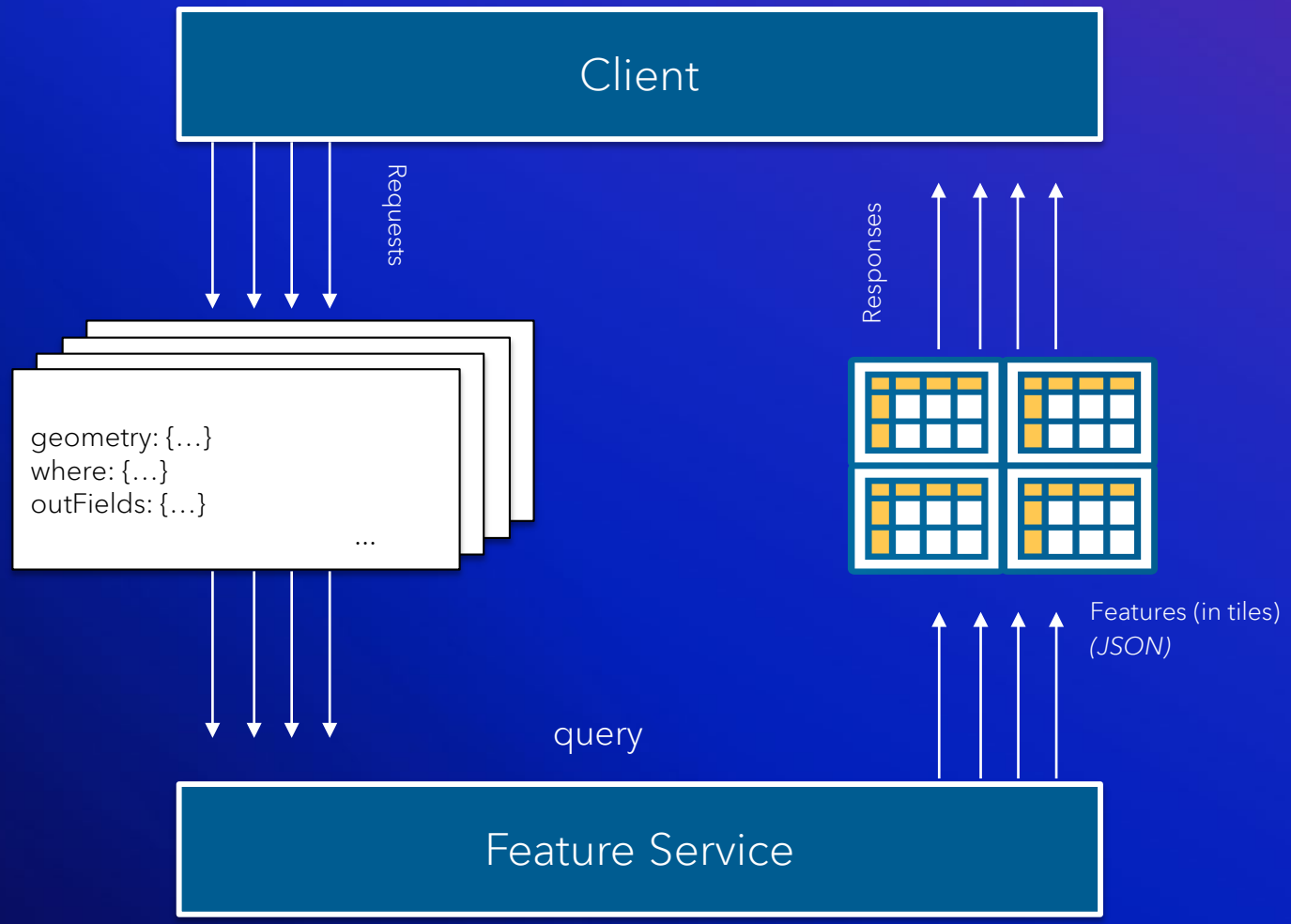
Vector Tile Service



Feature Service

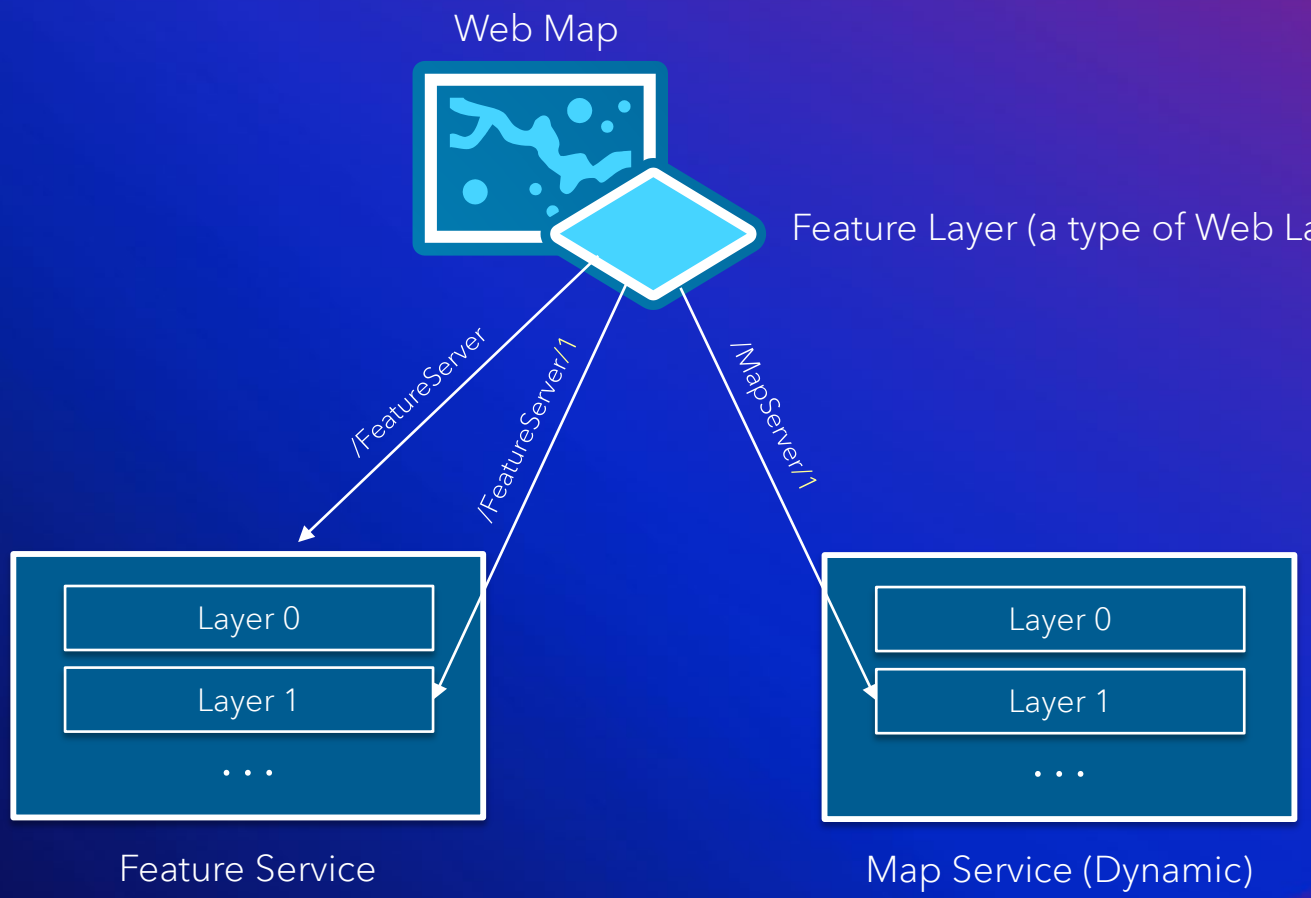


Feature Service



Best Practice Alert: Current standard for dynamic, operational layers & editing

Feature Service (server) vs. Feature Layer (client)



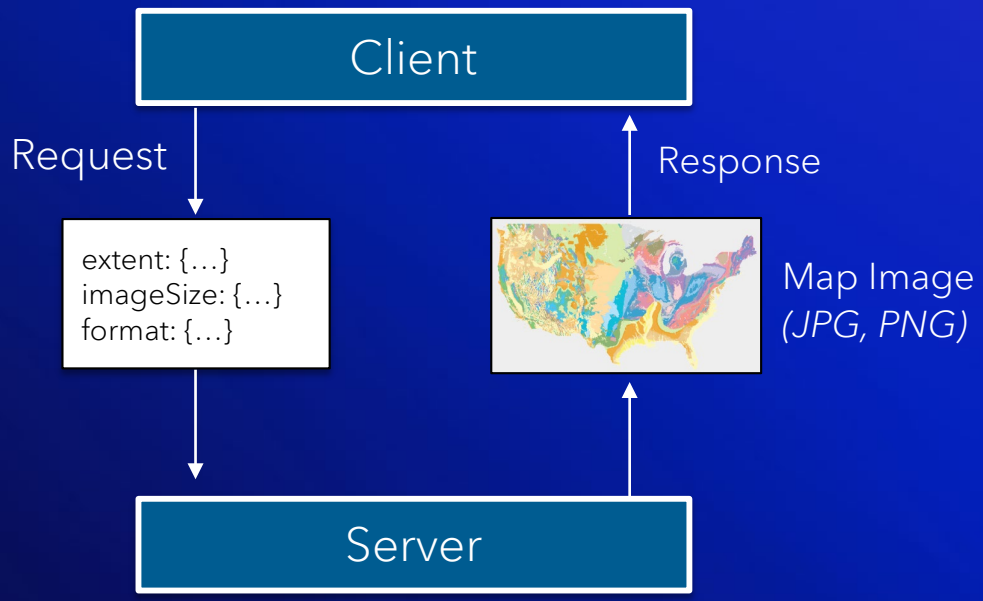
Does not support:

- *Editing*
- *Offline Sync*

- More or less the equivalent of a read-only feature layer

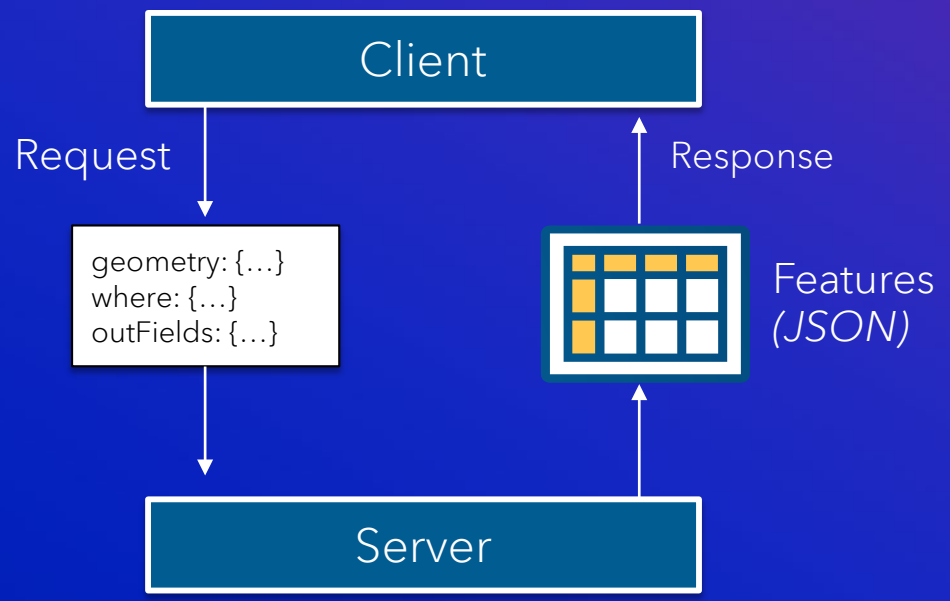
Features vs. map images

Map Images



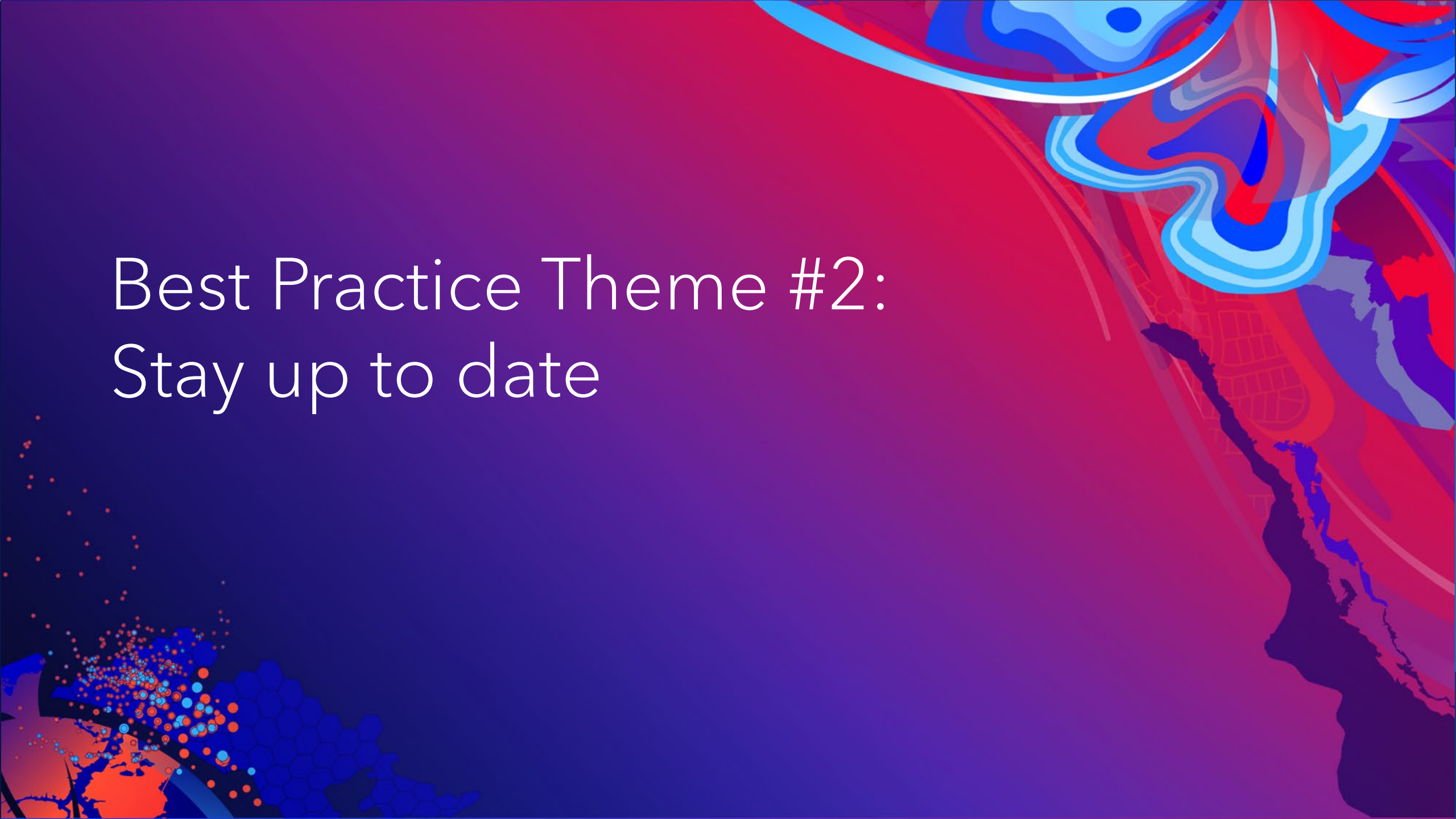
- Server-side rendering
- Standard (small) payload size
- Limited client experience & interactivity

Features



- Client-side rendering
- Variable (small-to-large) payload size
- Rich client experience & interactivity

Best Practice Theme #2: Stay up to date



Tiles

- Tile Content
  - Raster
  - Vector
- Benefits
  - Parallelization *(client and/or server)*
  - Caching …

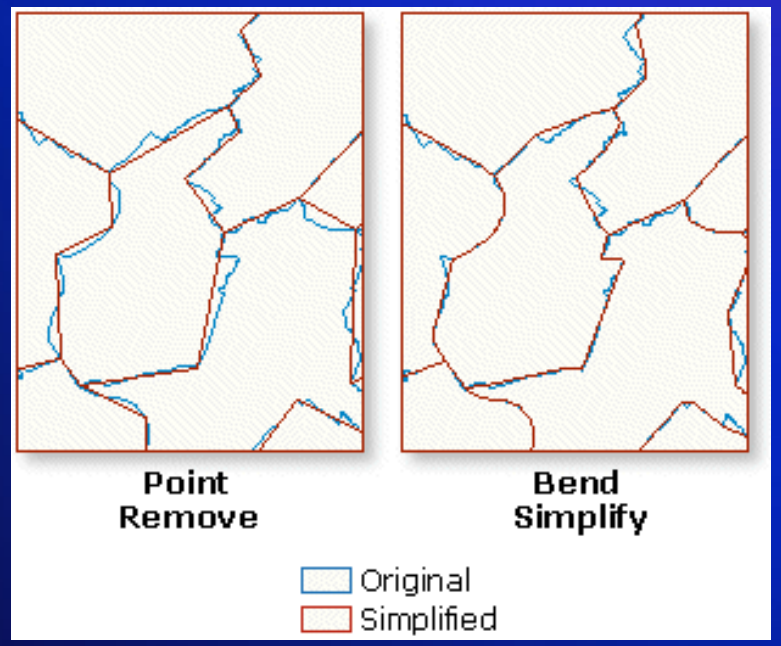
Best Practice Alert: Cache or Pregenerate tiles for faster performance. Great for public facing applications when you want to control tile levels

Caching

- Pre-Create Cache
- Cache On-Demand

Best Practice Alert: Let the browser handle caching for internal applications when you do not need to control the tile levels

Generalization



- Types
  - Douglas-Peucker *(Point Remove)*
  - Quantization
  - More … *(see help)*
- Approaches
  - Pre-generalize features
  - Generalize on-demand
- Benefits include:
  - Performance *(processing / bandwidth)*

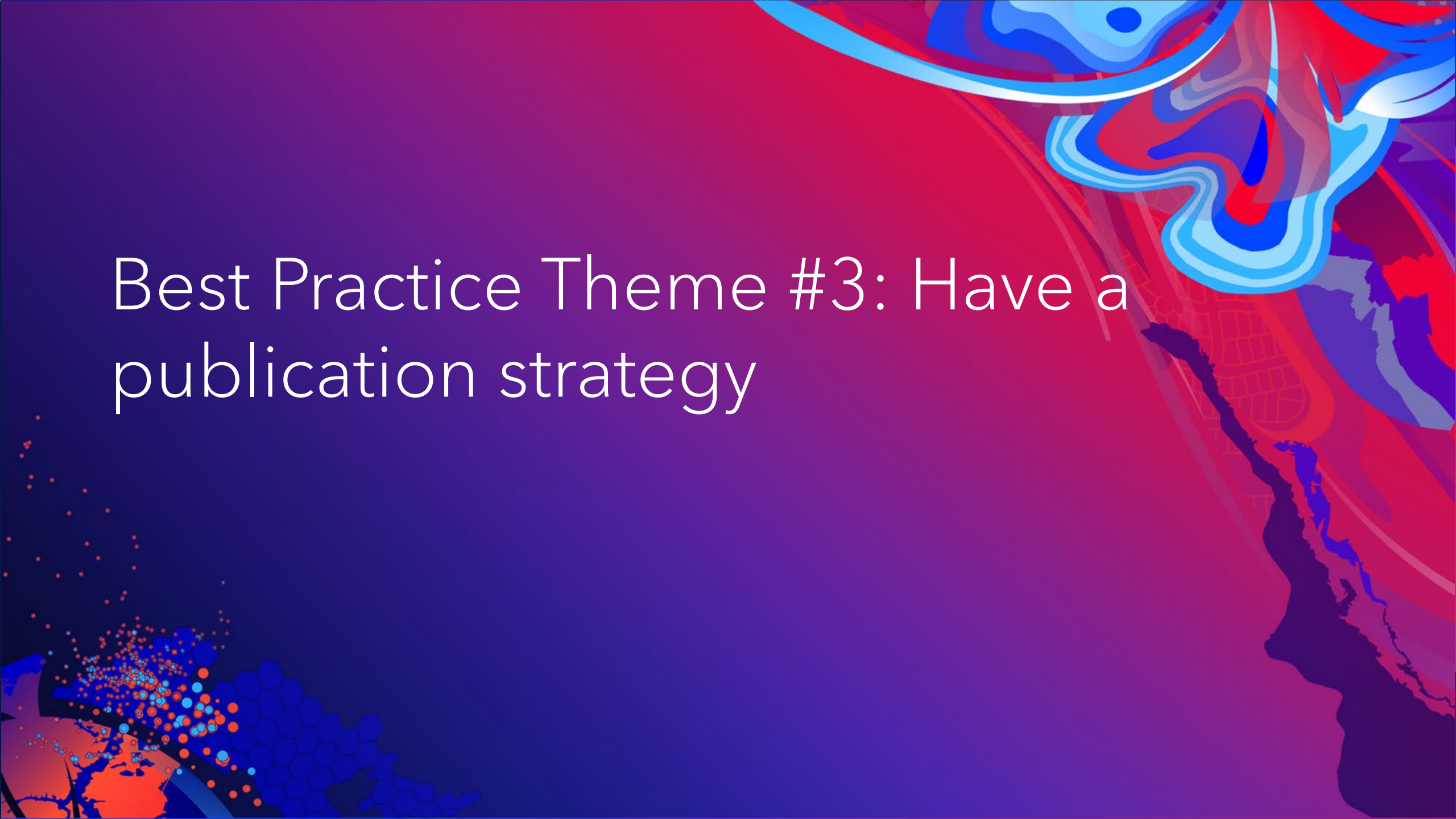
Best Practice Alert: Publish a service once and generalize on demand if you have data that covers a large geographic extent (Country wide)

Publishing Client: ArcGIS Pro

- Simplified GUI
  - Identity controlled publishing
  - Publishing pane
- New Capabilities
  - Publish Vector tiles
  - Overwrite services and layers

Best Practice Alert: Use ArcGIS Pro as your publishing client to take advantage of the newest capabilities

Best Practice Theme #3: Have a publication strategy



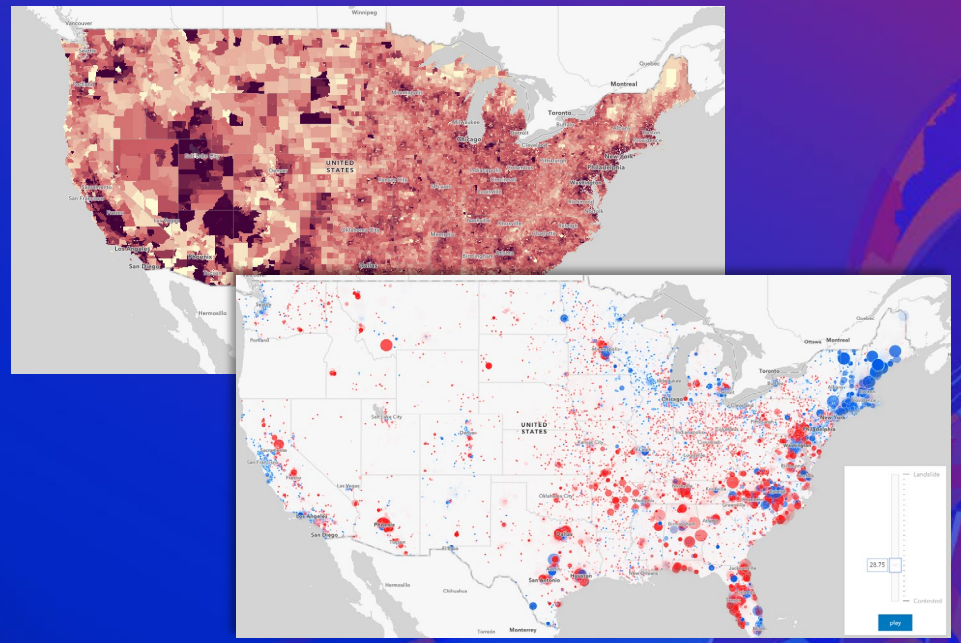
Publication strategy

1. Focus on business

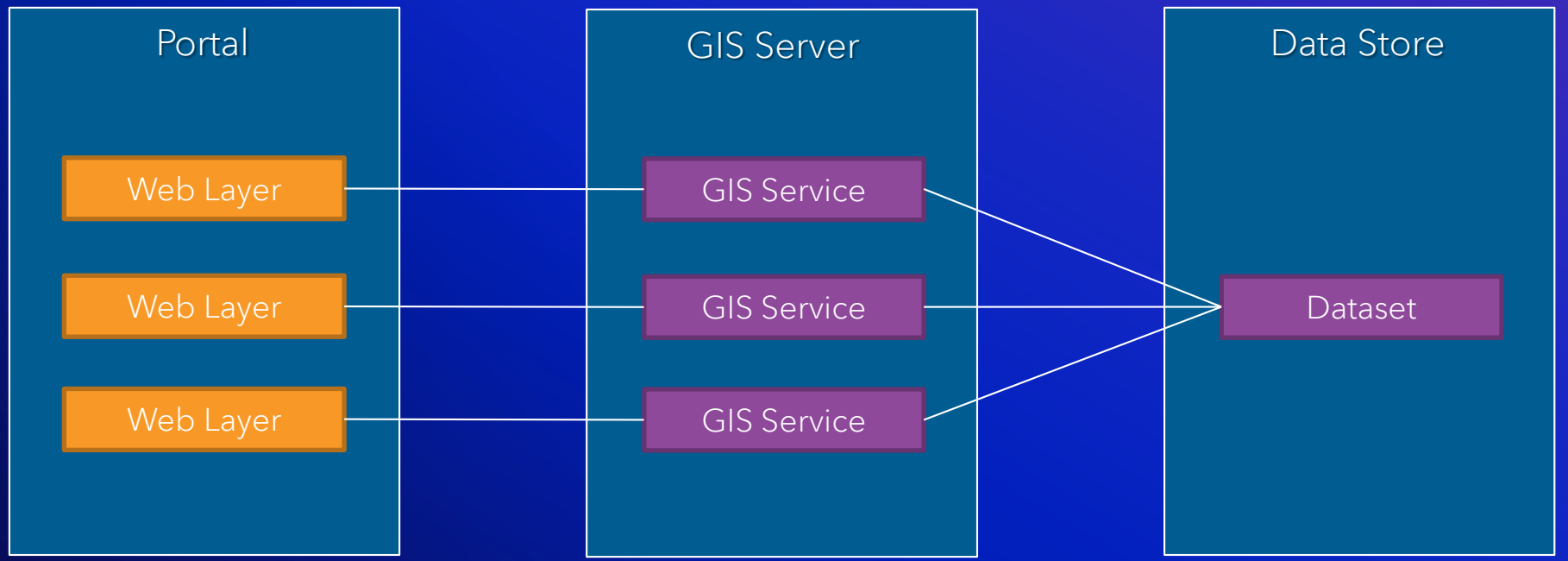
2. Start with the end (consumer), build bottom up (data)
   Understand users & use cases
   Gather requirements (business & IT)

3. Align/Select technology accordingly
   - Inventory data & architecture
   - Design data stores & access
   - Design GIS services
   - Design geoinformation model

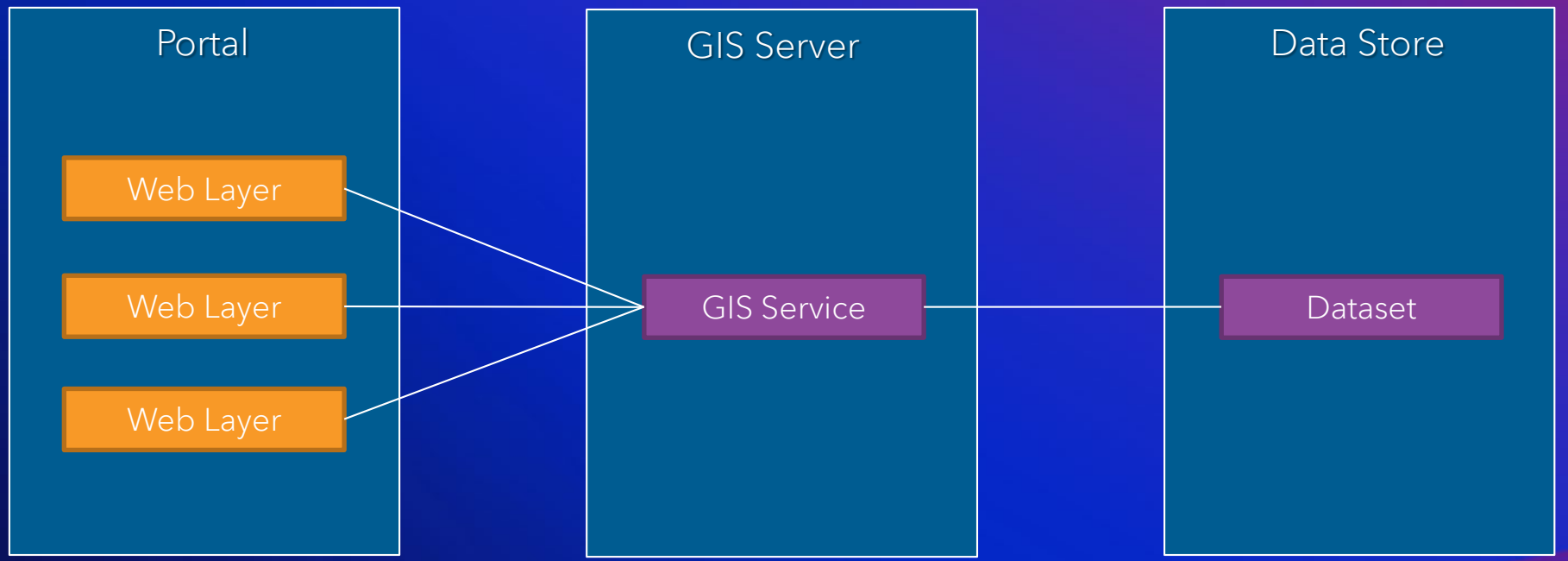
4. Adjust over time – be agile!
   Monitor!



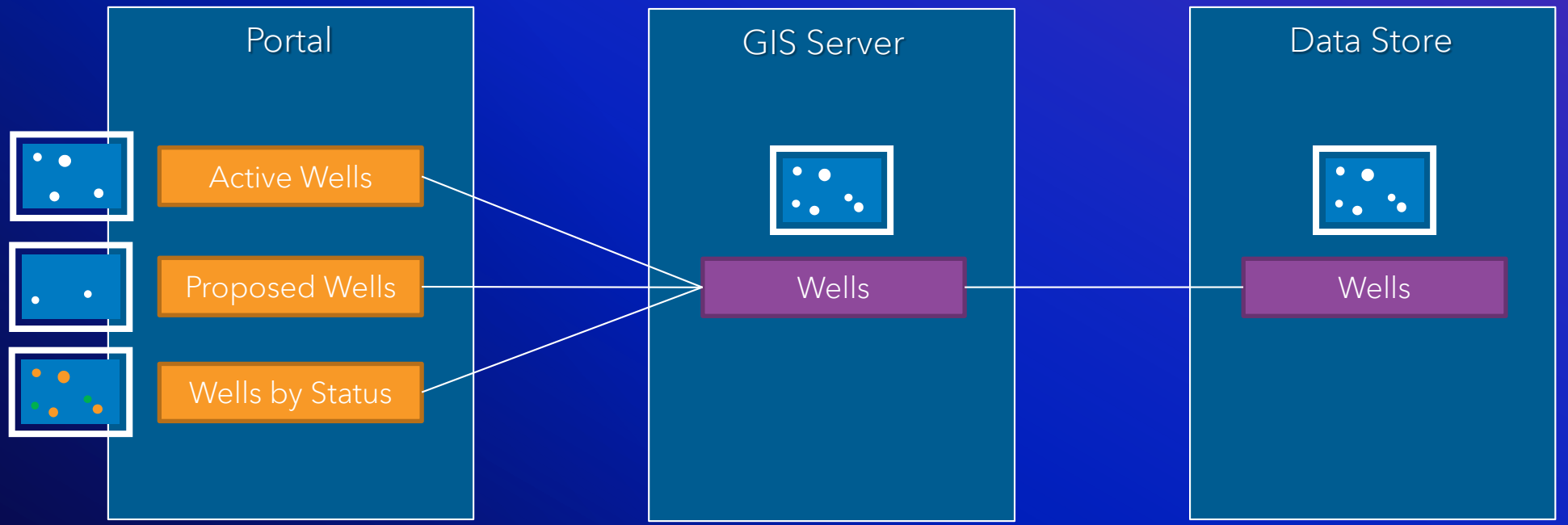
You could publish multiple services



Or Better: Use Views



Views example



Best Practice Alert: Use views to save storage space and customize the user experience

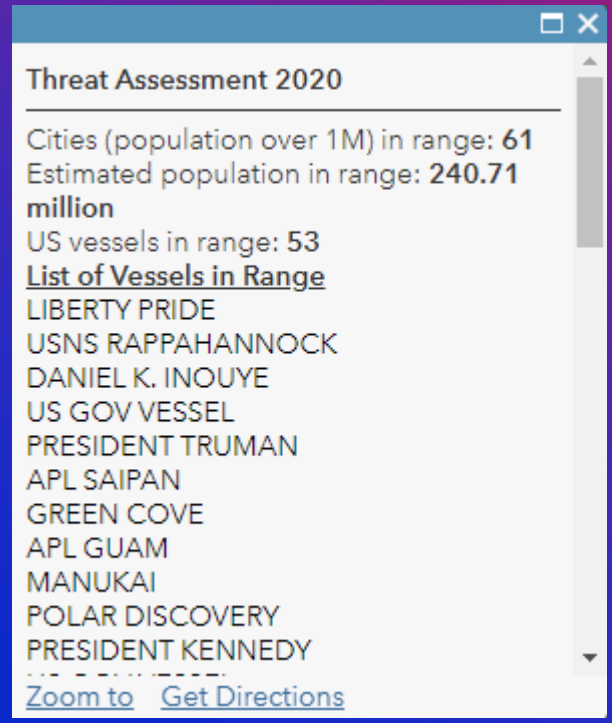
Smart Mapping – Beautiful Map-Making, Made Easy

Best Practice Alert: Publish a service once and use Smart Mapping for change the information model to fit the scenario

Arcade

```
var ships = FeatureSetByName($map,"US Flagged Vessels")
var targetships = Intersects(ships,$feature)
var results ="";
if (Count(targetships) > 0) {
    for (var ship in targetships) {
        results += TextFormatting.NewLine + ship.name;
    }
} else {
    results = "No US Vessels are in range";
}
return results;

```

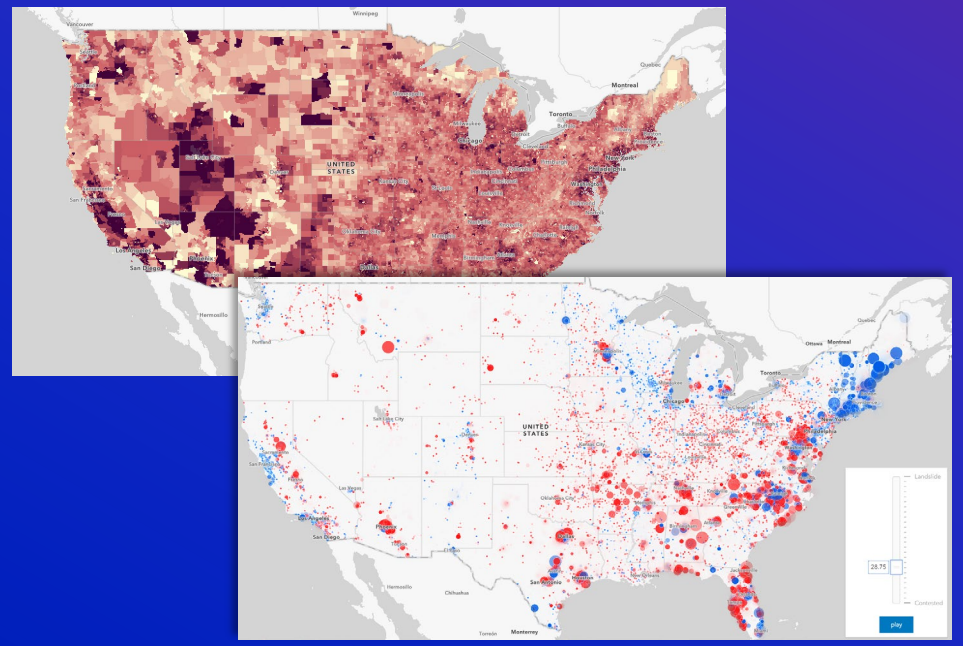


Best Practice Alert: Use Arcade to query other feature layers for more informative pop ups instead of complex joins.

Publication strategy

Driven by business & IT requirements
- Use case, and user “tolerance”
- Data type & update frequency
- Network bandwidth
- Client device
- Compute speed

Your options include …
- GIS service type selection
- Caching
- Generalization
- Making use of web map styling features



Performance matters now more than ever

Our Scenario

Use Case:

- Need a map/app to brief management
- App needs to be interactive
- Audience does not have GIS skills
- Data is only on my machine
- May be viewed in different browsers
- No editing

Our Scenario

What do I have:

- Map in ArcGIS Pro
  - Symbology configured how I want it
- Feature classes from multiple databases
- Services from ArcGIS Online

Our Scenario

What do I do?

A. Publish each map layer as a service for every possible scenario. Send links to services for viewing. Users can make own web map
B. Share the layers I want as services then make use of views to make the web map. Style. Send out link to web map.
C. Share the entire map as a web map, which creates a combined feature service and feature layer for everything I need. Embed resulting web map into a story map application. Send link to story map.

Best Practice Alert: Share completed maps as Web Maps and Select the configuration that best fits your purpose

Implementing the Strategy #1

Our Scenario

Use Case:

- Need a feature layer in ArcGIS Online
- Will be used for a variety of analytics, maps, apps
- End users are strong GIS users
- Needs to be flexible

Our Scenario

What do I have:

- A CSV on my machine
- Data is static
- Only an ArcGIS Online Org
- Loaner laptop with no ArcGIS Products on it
- A timeline of yesterday

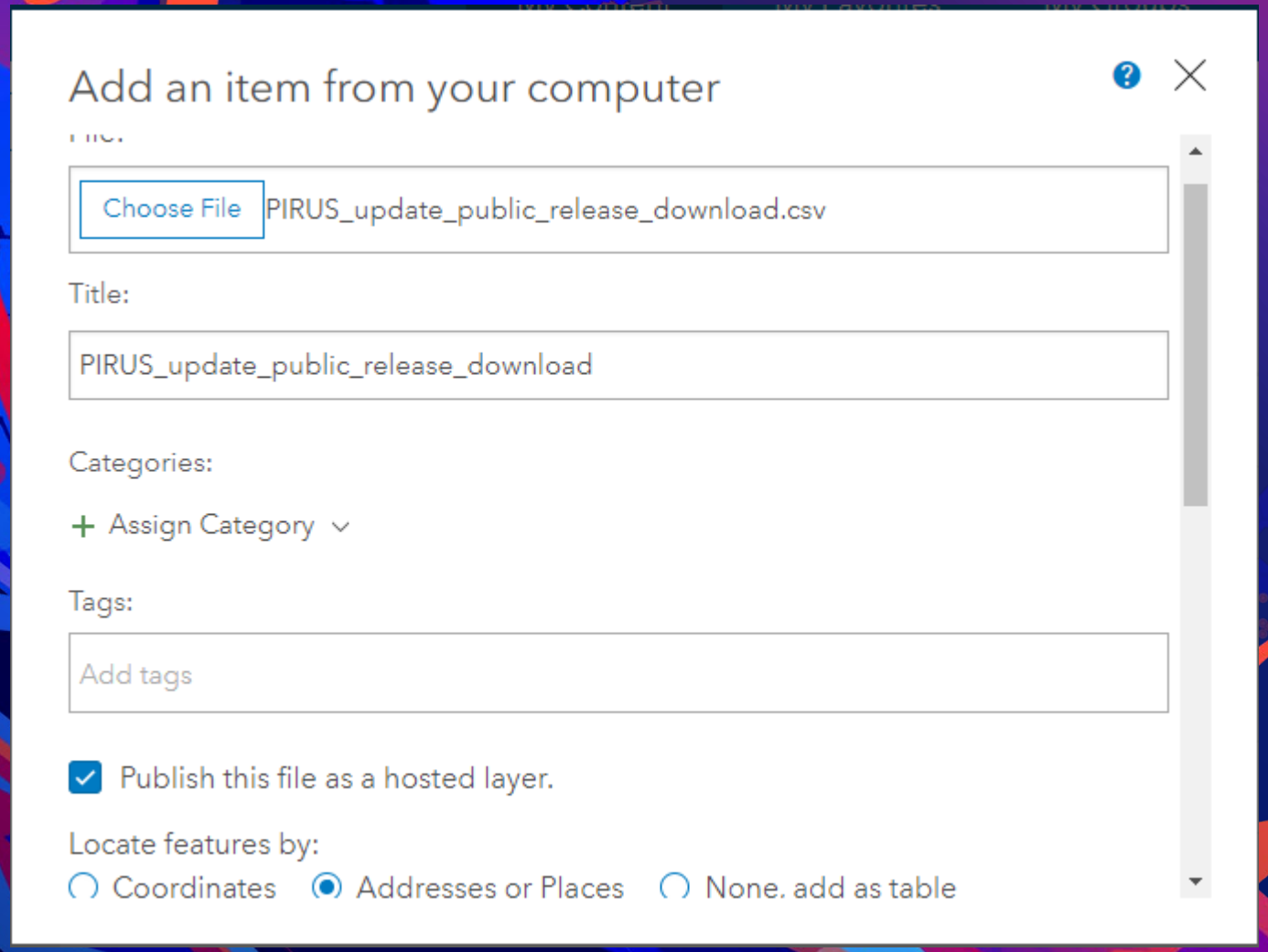
Our Scenario

What do I do?

A. Install ArcGIS Pro, Create an XY layer and then publish a service
B. Upload the CSV directly to ArcGIS Online as a hosted feature service/feature layer for the analysts to use as they please.
C. Install ArcMap, Generate a feature class from the XY, publish as many services as I need to cover every scenario that I can think of.

Best Practice Alert: Service Enable CSV files by uploading them to ArcGIS Online and creating a hosted feature service

Implementing the Strategy #2



Key Take-Aways

- Build up your technical foundation and use Esri's help documentation
  - https://enterprise.arcgis.com/en/server/latest/publish-services/windows/what-types-of-services-can-you-publish.htm
- Staying up to date with software releases lets you take advantage of technology enhancements
- Leverage ArcGIS Pro as your primary publishing application
- Use Views and Smart Mapping rather than publishing multiple services
- If you need something published quickly, use the capability of ArcGIS Online to publish hosted feature services
- Good publication strategies ensure that appropriate content is delivered to consumers in a well performing, scalable, reliable, and secure manner

Contact

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Presentation Title

Presenter Names

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