

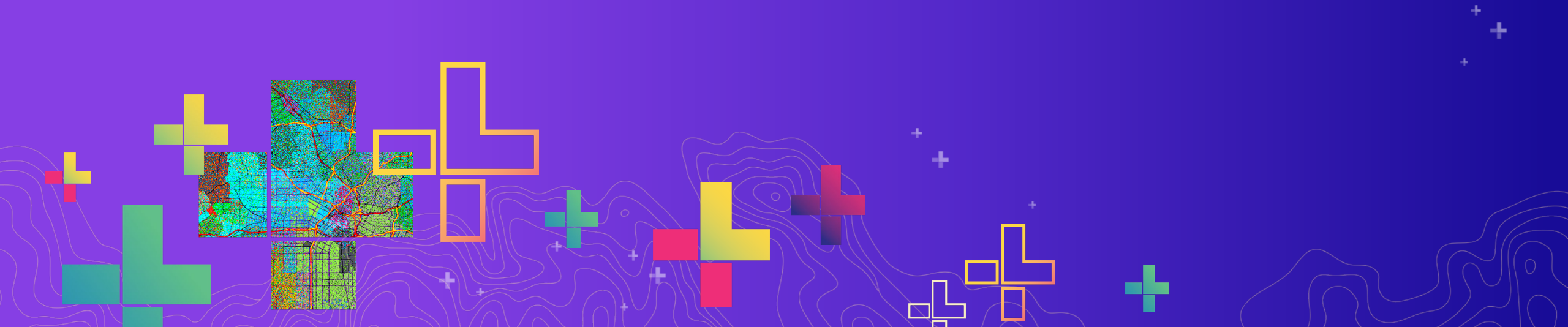


ArcGIS Runtime

ArcGIS Runtime SDKs: Optimizing Your Data Workflows for Working Offline

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Agenda

- Optimizing data
- Working with versioned data
- Sync strategies
- Data encryption
- Other considerations



Optimizing Data



Optimizing Data

- Several methods available to achieve an optimized workflow
 - Map, layer and dataset design
 - Tool options
 - API options



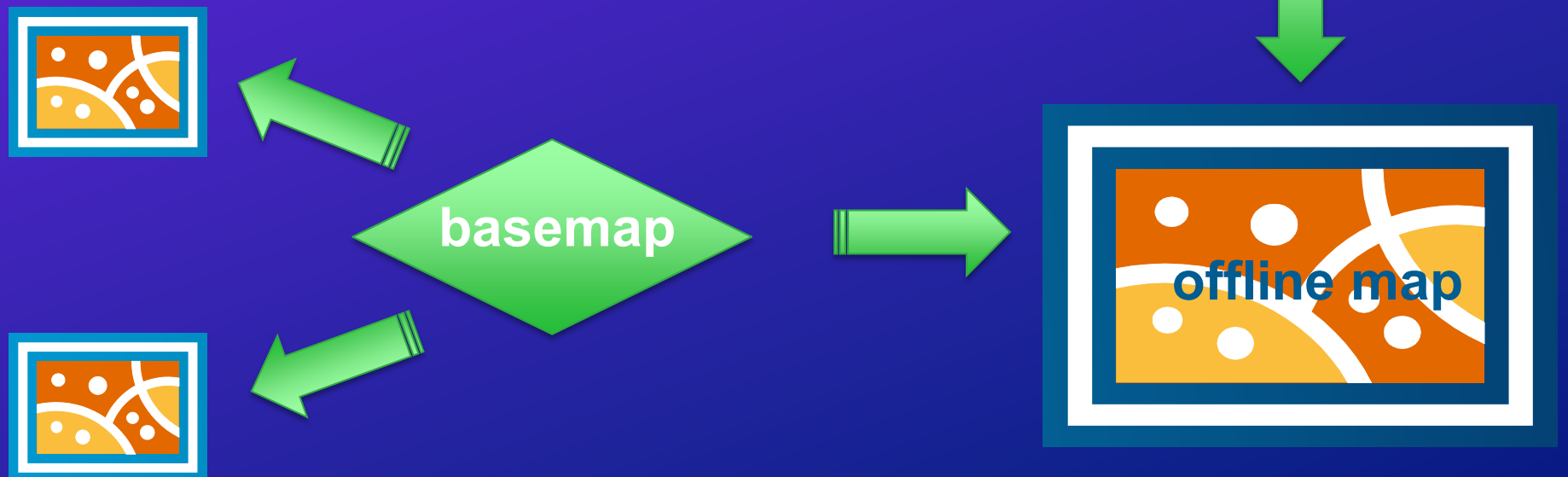
Optimizing Workflows – Map and Layer Design

- Just because its easy, doesn't mean it right!
- What data is required in your workflows?
- Think about data currency
 - How often does your data update?
- Not everything needs to be identifiable
- Not everything needs to be editable



Optimizing Data – Basemaps by Reference

- Preplanned or On-demand workflows
- Author web map with name of local basemap file (.tpk or .vtpk)
- Side-load/download basemap ahead of time
- Use local file instead of downloading basemap



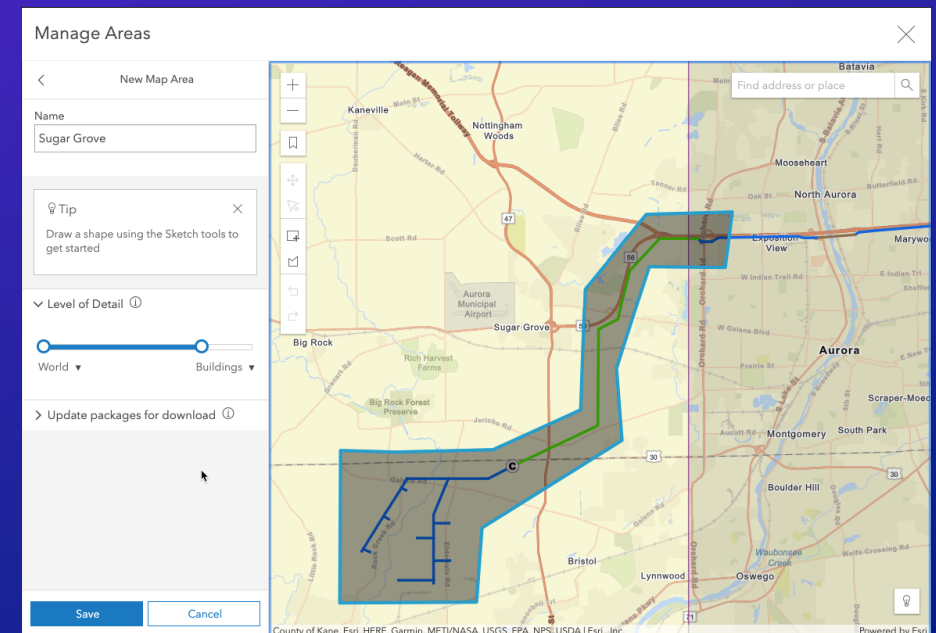


Basemaps by Reference

Nick

Optimizing Data – Polygon Map Areas

- Optimizes Basemap and Operational Data
- Significant data savings for linear features such as road corridors or utility lines
- ArcGIS Online Map Area Editor makes this easy
- Be aware that any edits must also satisfy the query to be accepted



Polygon Map Areas

Nick



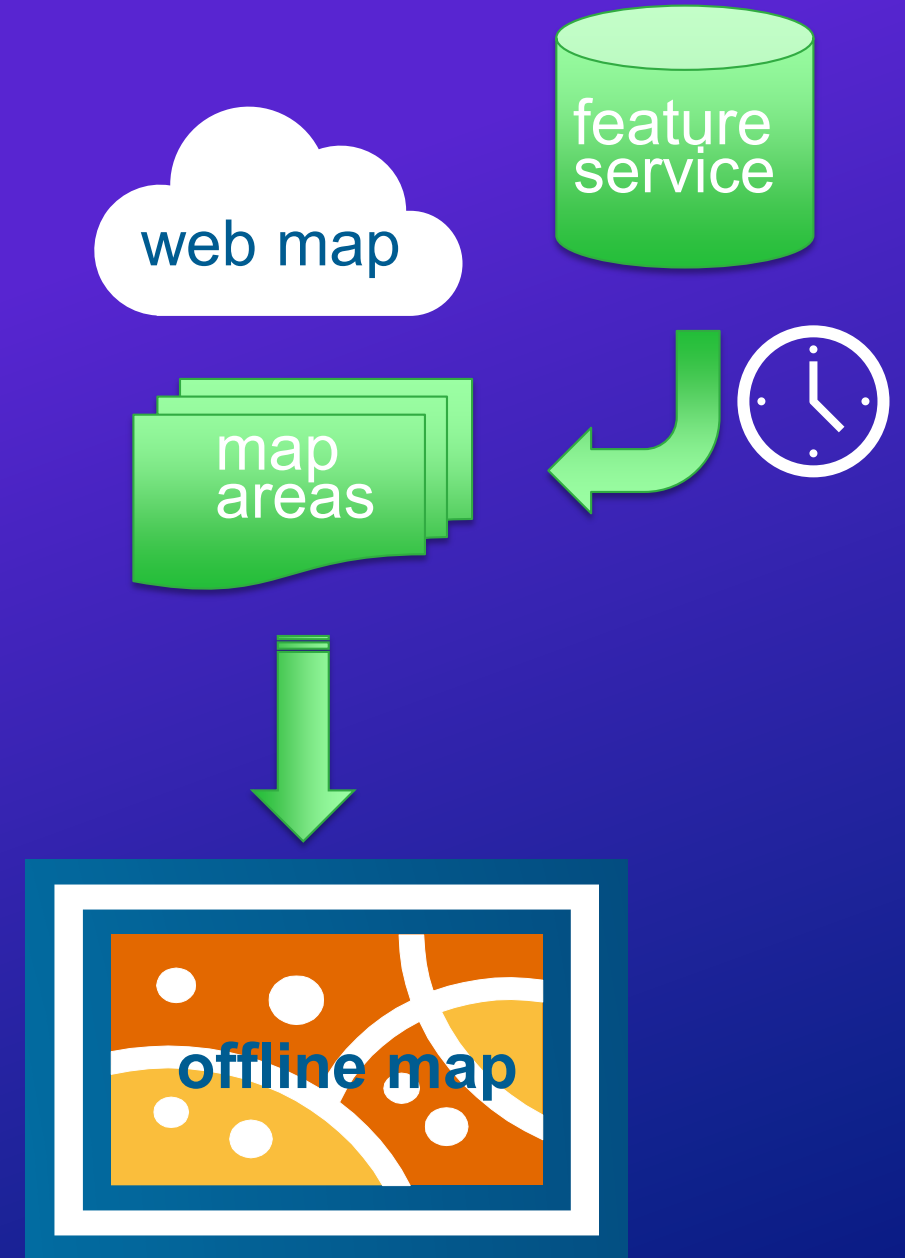
Optimizing Data – Pre-planned and On-demand

- On-demand workflow
 - + Productive authoring experience with little overhead to support offline use
 - + Supports data editing with sync
 - Must consider performance impacts when there are a large number of field users
- Pre-planned workflow
 - + Productive authoring experience with a small amount of upfront cost for defining offline areas
 - + Supports data editing with sync
 - ± Field areas are restricted to admin selected areas



Optimizing Data – Schedules Updates

- Pre-planned workflow
- Read Only workflow
- Set on the map area by the author
- Updates cached on a regular schedule
- Highly scalable
 - Many users download the same changes





Scheduled Updates

Nick

Optimizing Data – API Options

- Fine Grained Control with API Overrides
- Works with On-demand Workflow
- Straightforward programming pattern



Optimizing Data – API Overrides Programming Pattern

- Basic parameters
 - Create the default `GenerateOfflineMapParameters`
 - Adjust parameters as required - min/max scale, AOI, attachments, etc
- Advanced overrides
 - Create the default `GenerateOfflineMapParameterOverrides` to access and adjust the underlying parameters for taking individual services offline:
 - `GenerateGeodatabaseParameters`
 - `ExportVectorTilesParameters`
 - `ExportTileCacheParameters`
- Create a `GenerateOfflineMapJob` with the parameter overrides and run it





Using Overrides With the API

Nick

Optimizing Data – Taking Individual Services Offline

- Working with OfflineMapTask is simple and powerful
- For complete control consider working with individual services
- Use specific Tasks
 - ExportTileCacheTask
 - Tile package (.tpk)
 - ExportVectorTilesTask
 - Vector tile package (.vtpk) and their associated style resources
 - GeodatabaseSyncTask
 - Sqlite geodatabase (.geodatabase)



Optimizing Data – Other Data Reduction Strategies

- Schema only
- Attachments
- Definition queries
 - Be aware that any edits must also satisfy the query to be accepted
- Consider using "for export" versions of vector tile services (with reduced fonts)
 - Ensure you test in your area of interest



Working With Versioned Data



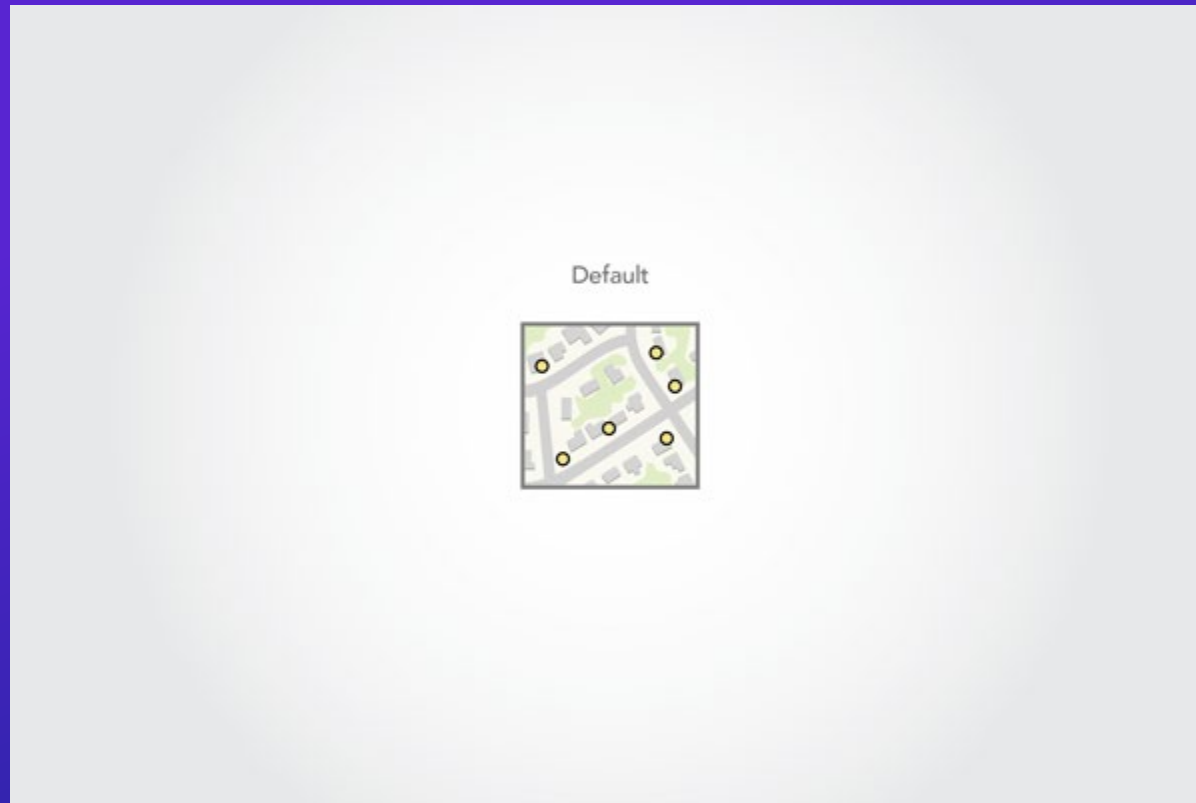
Working With Traditional Versioning on ArcGIS Enterprise

- Two workflows
 - Version per Map – this is the default
 - Version per User
- Good [online documentation](#)

Traditional Versioning – Version per Map

- Default behaviour
- Creates a new version each time a map is taken offline
- Edits to offline map will be synchronized against specific version
- Always guaranteed the latest data from published map
- Version name <userid>_<FeatureService>_<uniqueID>
- Additional reconcile and post process required on server
- Good for quick offline editing sessions (hours to a day or two)
 - Data maintenance, field inspections, etc

Version Per Map Example



Version Per Map Example



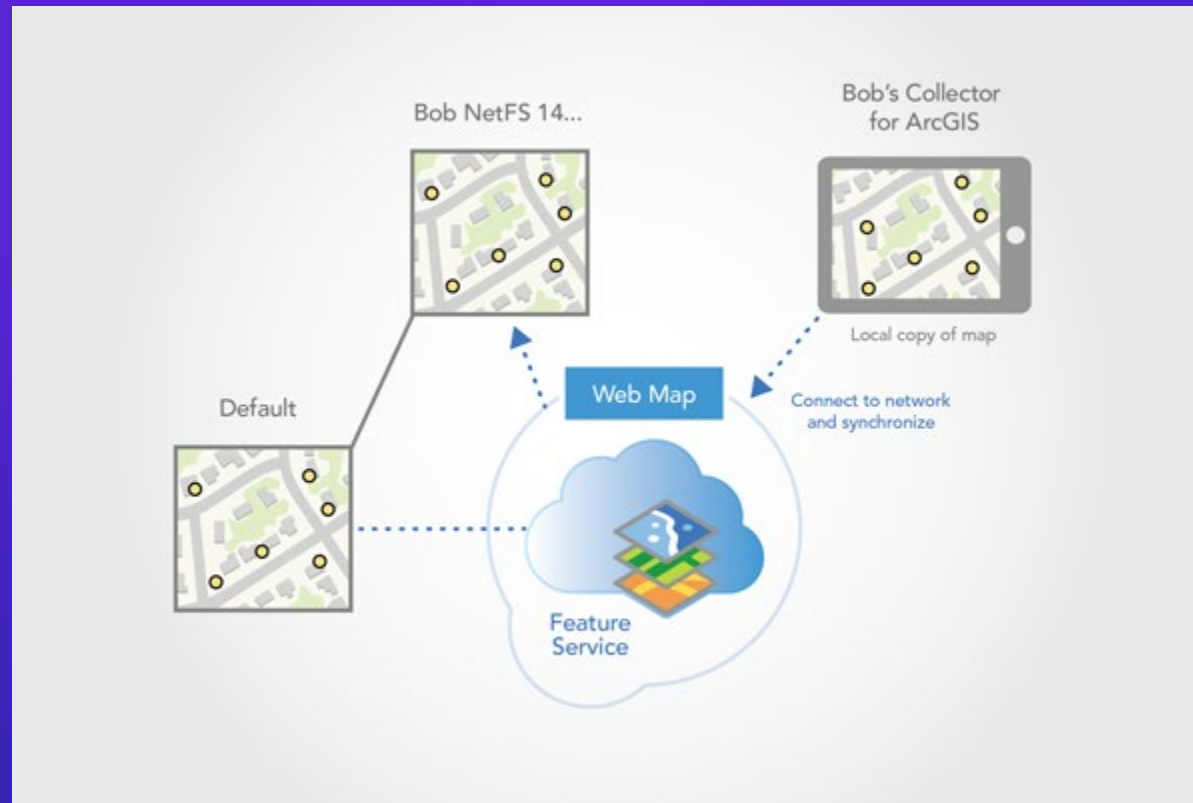
Version Per Map Example



Version Per Map Example



Version Per Map Example



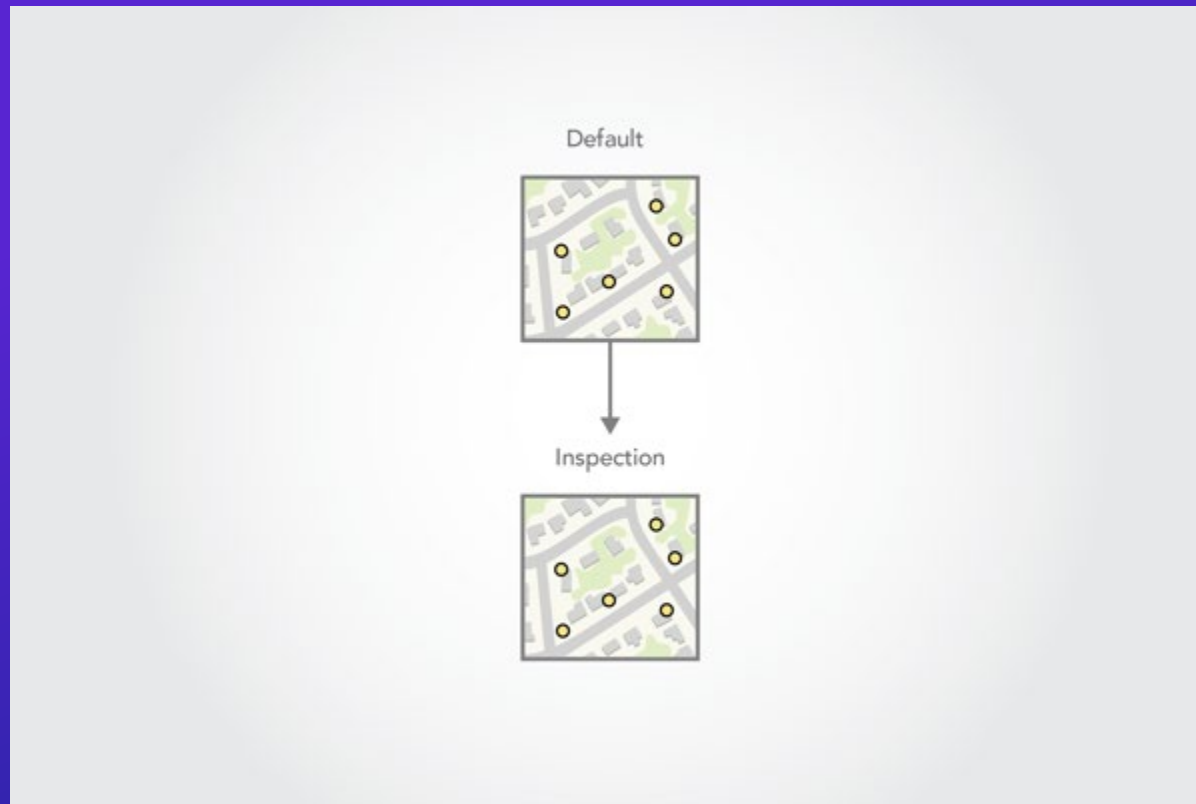
Version Per Map Example



Traditional Versioning – Version per User

- Creates a new version for each person taking a map offline
- Multiple downloads by same user on different devices gets the same version
- Not guaranteed to retrieve the latest data from published map
- Version name <userid>_<FeatureService>
- Additional reconcile and post process required on server
- Good for short duration field work (days to a week or two)

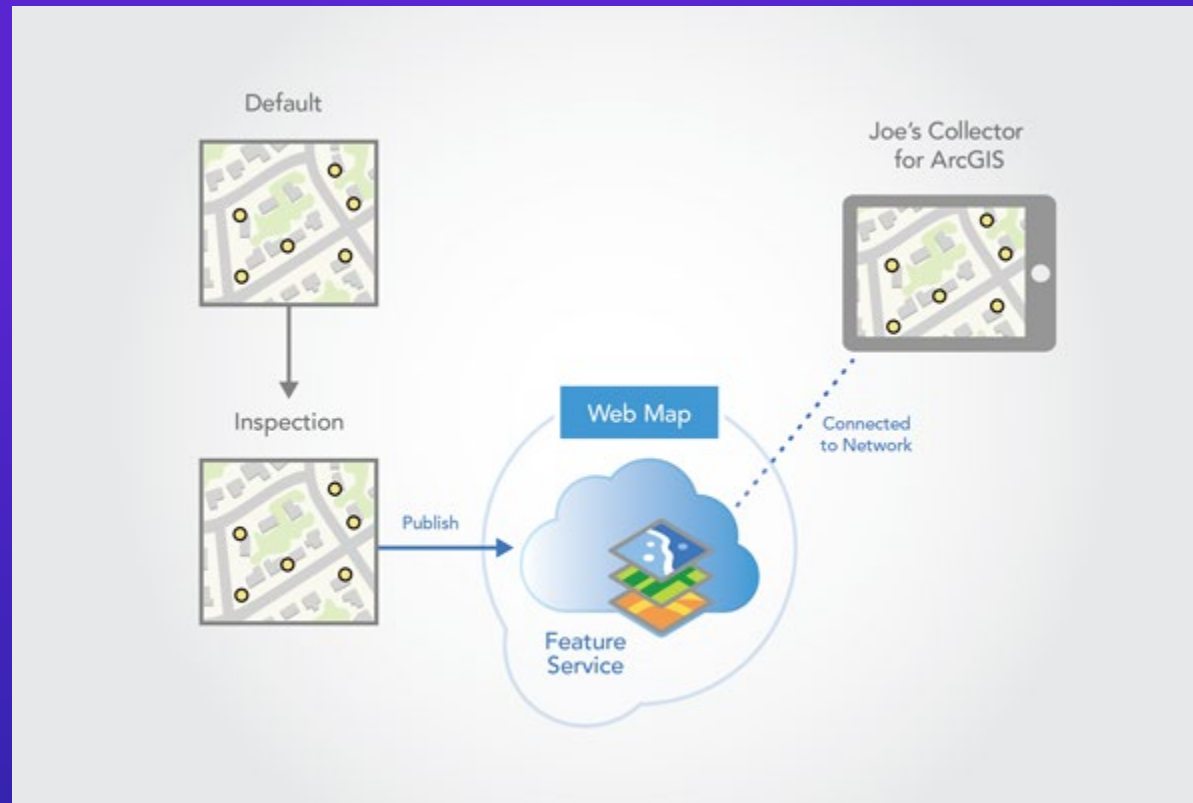
Version Per User Example



Version Per User Example



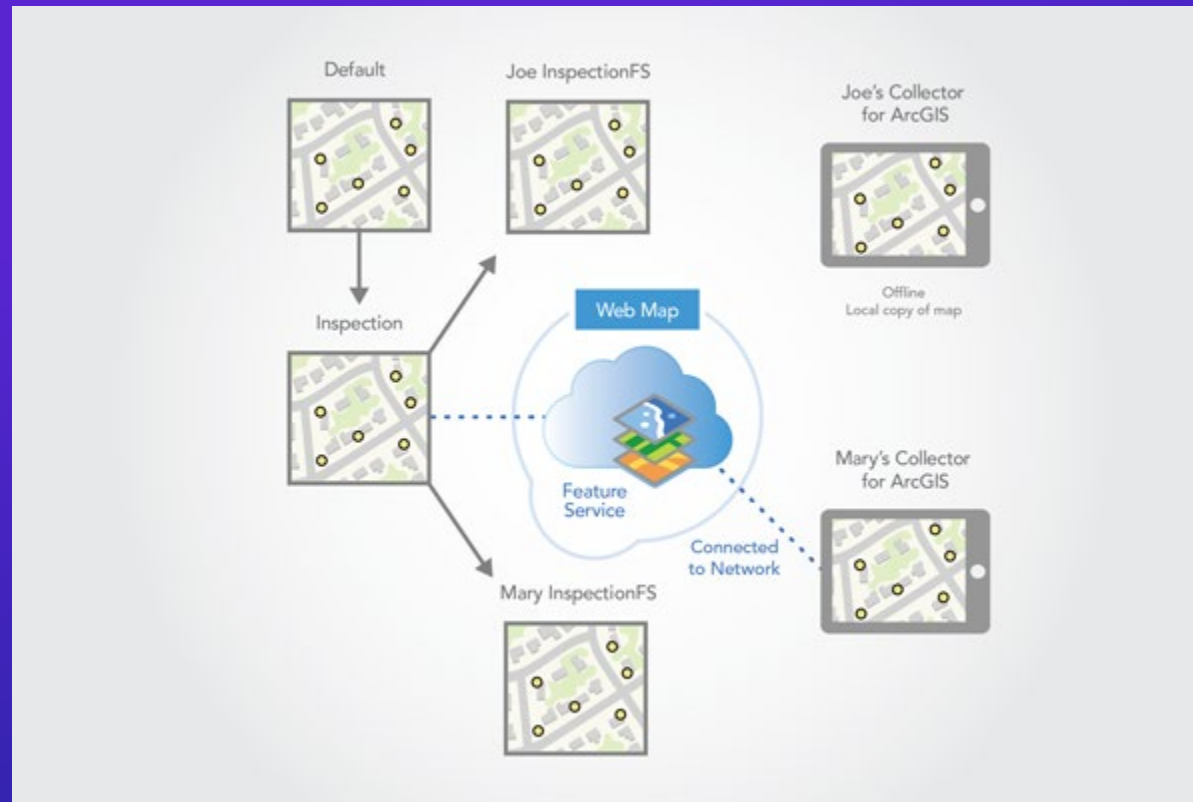
Version Per User Example



Version Per User Example



Version Per User Example



Version Per User Example



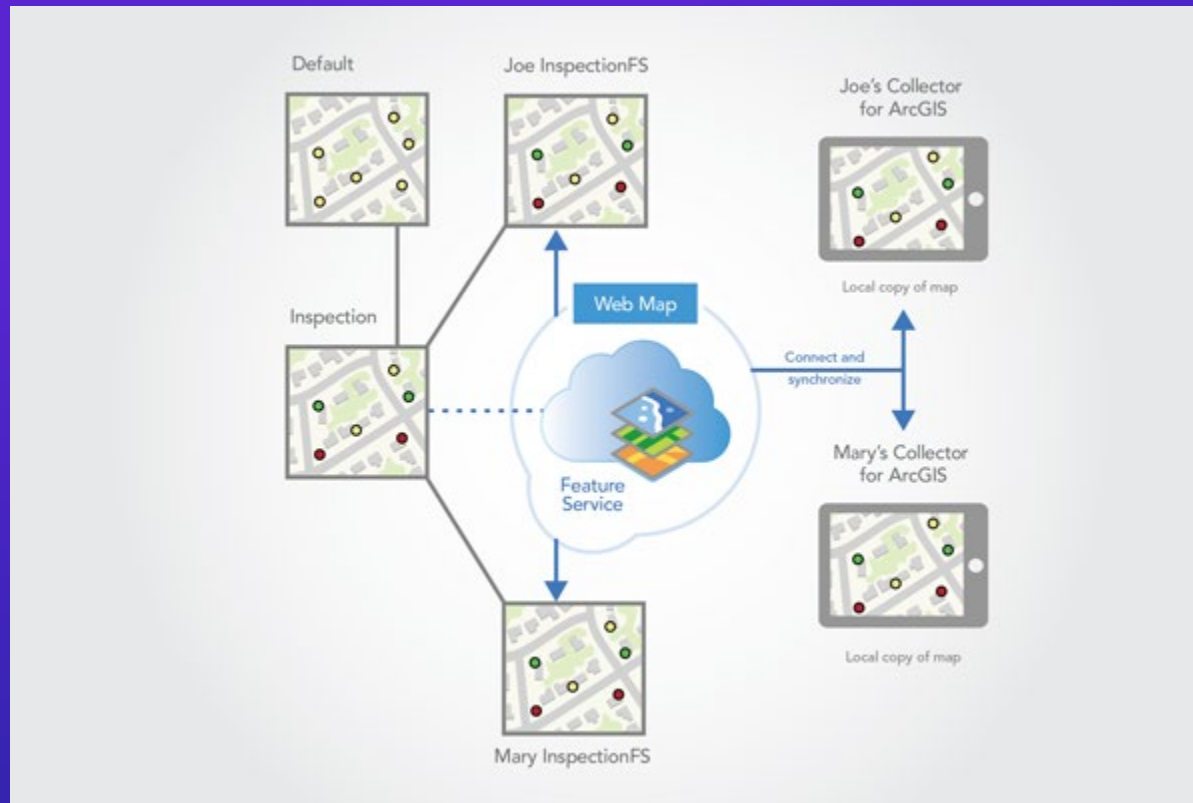
Version Per User Example



Version Per User Example – Reconcile and Post Nightly Process



Version Per User Example – Reconcile and Post Nightly Process



Version Per User Example – Final Reconcile and Post

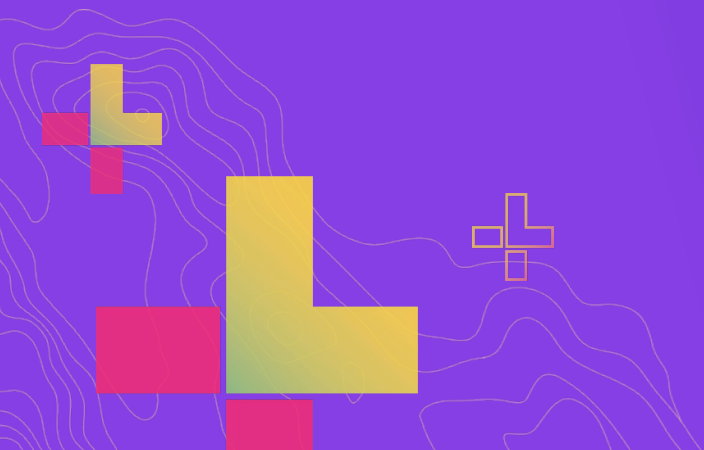


Branch Versioning

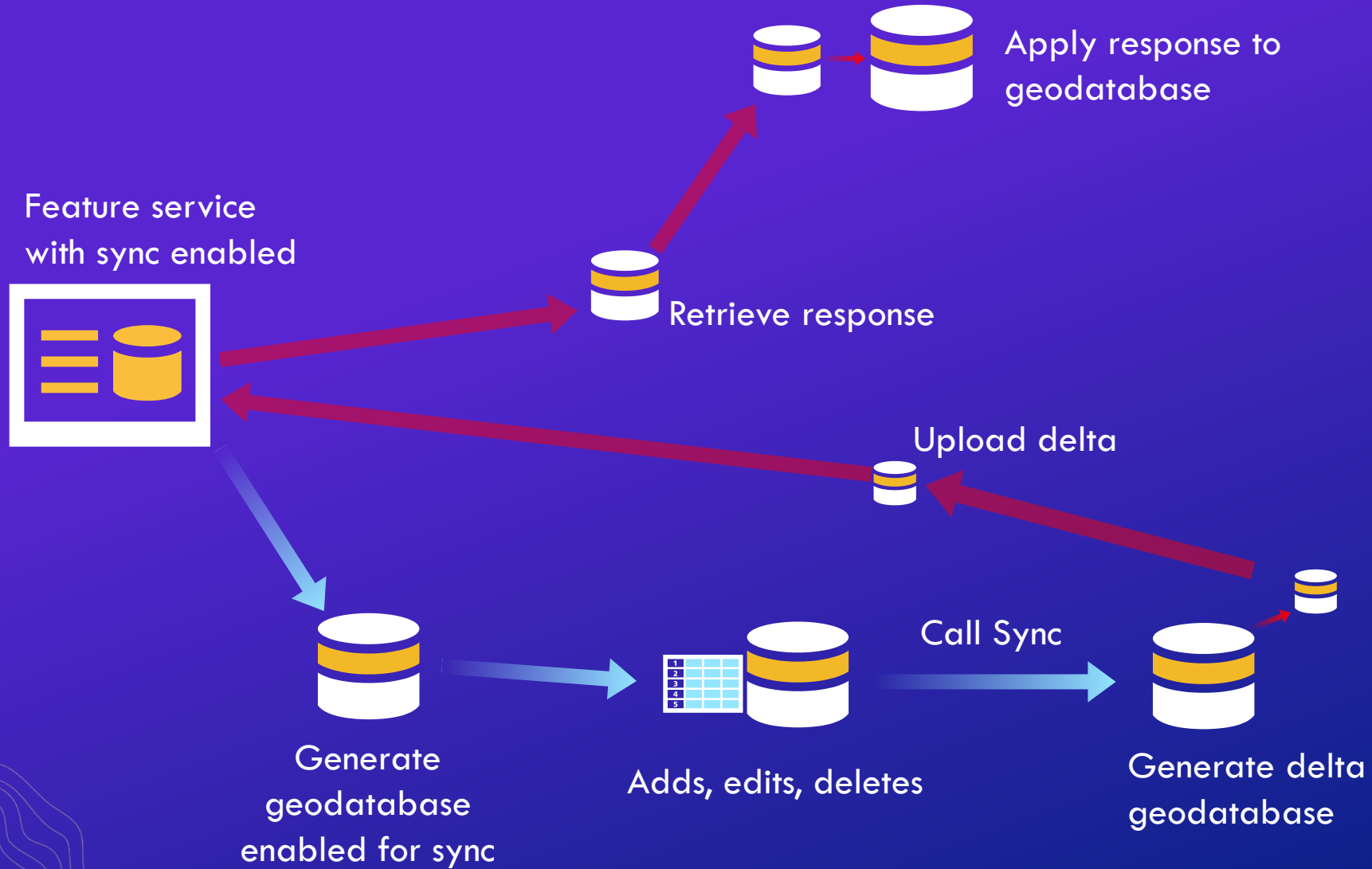
- Must be connected to default version
- Offline data uses a simple features model
 - Edits made create dirty areas that must be validated with ArcGIS Pro
- Scalable to a larger number of editors than traditional versioning



Sync Strategies



Think About Sync!



Sync Direction Matters

- Bidirectional – Changes on client sent to server and changes on server sent to client
 - Default
 - Performs the most work
- One-way Sync
 - Upload from client – lightweight operation
 - Download from client – Heavyweight operation as it requires a unique lock on the server's database
- Factor one-way syncs into daily workflows
 - Combine preplanned for initial delivery of data then one-way uploads
- For Snapshots of data consider sync NONE to stop replica generation on server



Data Encryption



Data Encryption

- No built-in data encryption at rest
 - This is a research area currently
- Devices should have device locking enabled
- If data security is a concern consider a Mobile Device Management (MDM) solution

Other Considerations



Other Considerations

- Clean up your data on completion of your offline workflow
 - Close Packages – there is an API
 - Unregister geodatabases
- What happens when something goes wrong?
 - Save out JSON from the Job to see all messages



Thank You





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