outsystems

Data Synchronization Basic Patterns

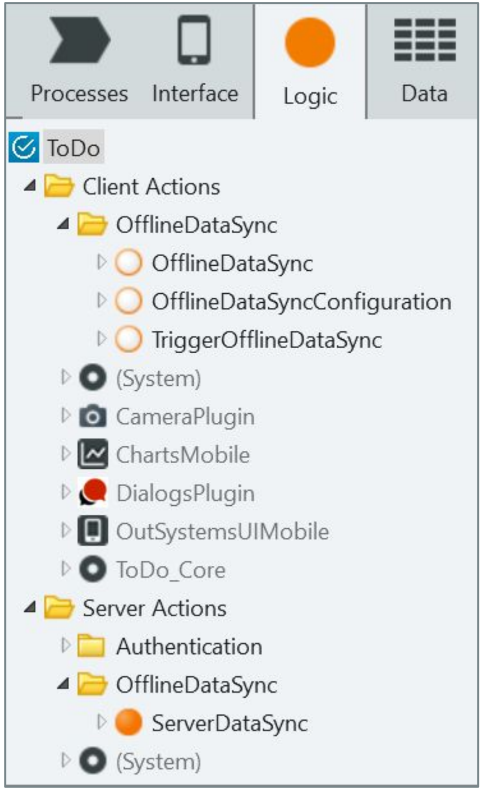
Topics

- Synchronization Actions
- Basic Synchronization Patterns
  - Characteristics
  - Accelerators
  - Read-Only Data
  - Read / Write Last Write Wins
  - Advanced Patterns

Synchronization Actions

- Client Actions
  - Sync: OfflineDataSync
  - Configure: OfflineDataSyncConfiguration
  - Trigger/Start: TriggerOfflineDataSync

- Server Action
  - Sync: ServerDataSync



Processes Interface Logic Data

- ToDo
  - Client Actions
    - OfflineDataSync
      - OfflineDataSync
      - OfflineDataSyncConfiguration
      - TriggerOfflineDataSync
    - (System)
    - CameraPlugin
    - ChartsMobile
    - DialogsPlugin
    - OutSystemsUIMobile
    - ToDo_Core
  - Server Actions
    - Authentication
    - OfflineDataSync
      - ServerDataSync
    - (System)

Synchronization Patterns

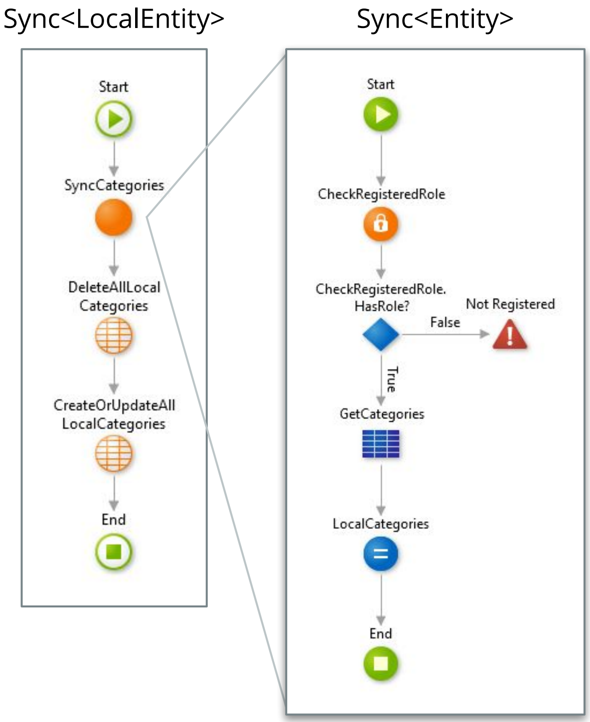
Synchronization Characteristics

- Data
  - Database Entities
  - Local Storage Entities
  - Metadata Entities for synchronization
  - Metadata attributes on Entities to track changes
  - Update data depending on network status & pattern

- Logic
  - Steps need to sync data to the server
  - Depends on the pattern that is being followed

Read-Only Data

- Simplest synchronization pattern
  - Server can update data in the database
  - Device does NOT change data in local storage
    - If it does, changes are not sent to the Server
- Synchronization steps
  - Client calls Server to retrieve data
  - Server returns all data
  - Client deletes current local storage
  - Client creates new local storage Entities
- Sends all data, every time
  - Simple, but not efficient for large data sets

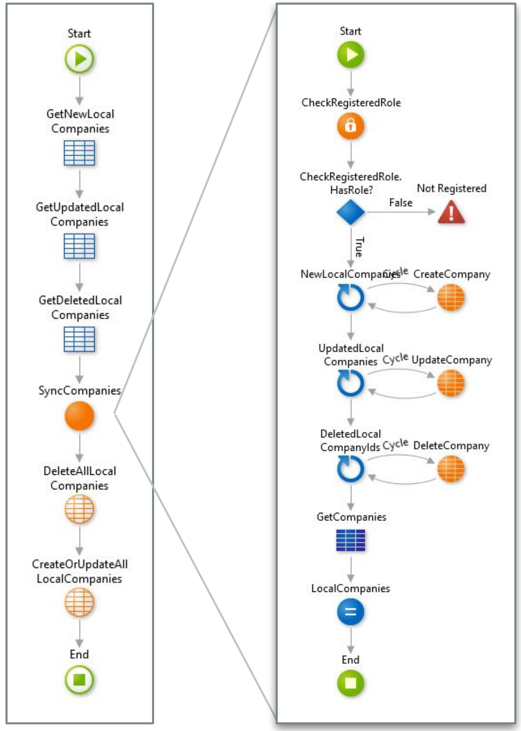


Read/Write Last Write Wins

- Synchronization steps
  - Client retrieves changed Records
    - Added, updated and deleted Entity records
  - Client calls Server with lists of changes
  - Server updates data
    - Added, updated and deleted Entity records
  - Server returns updated list of data
  - Client deletes current local storage
  - Client creates new local storage Entities

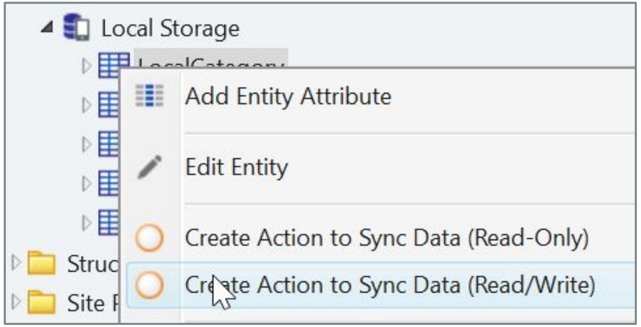
- All data is returned with each synchronization
  - Simple, but not efficient for large data sets

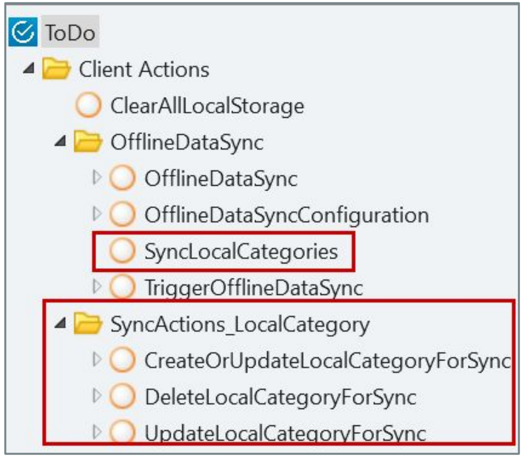
Sync<LocalEntity> Sync<Entity>

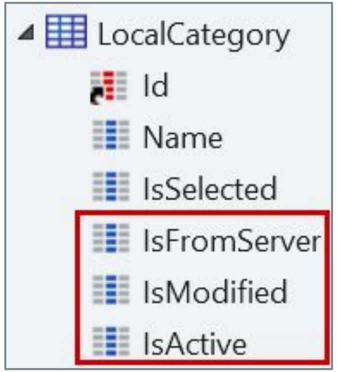


Accelerators

- Local Entity has option to automatically create the sync logic
    - Only if Local Entity was created via the DB Entity
- Read-Only Data
    - Creates SyncLocal<Entity> and Sync<Entity> Actions
    - OfflineDataSync Action should call SyncLocal<Entity> Action
- Read-Write Last Write Wins
    - Also creates additional Actions and attribute Entities


Local Storage
LocalCategory
Struc
Site F
Add Entity Attribute
Edit Entity
Create Action to Sync Data (Read-Only)
Create Action to Sync Data (Read/Write)


ToDo
Client Actions
ClearAllLocalStorage
OfflineDataSync
OfflineDataSync
OfflineDataSyncConfiguration
SyncLocalCategories
TriggerOfflineDataSync
SyncActions_LocalCategory
CreateOrUpdateLocalCategoryForSync
DeleteLocalCategoryForSync
UpdateLocalCategoryForSync



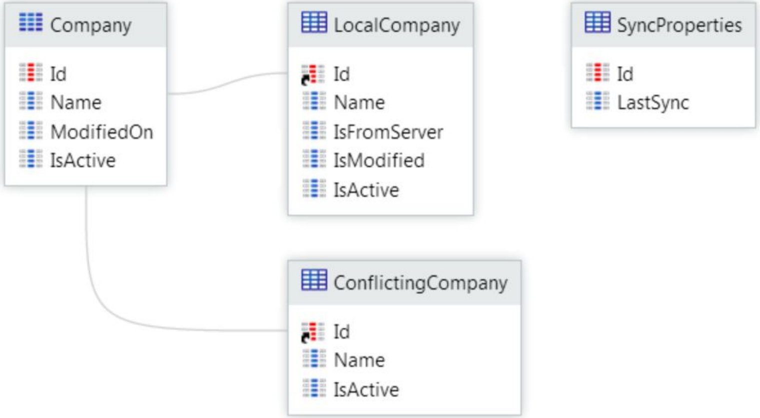
Advanced Synchronization Patterns

OutSystems documentation introduces three other patterns

- Read-Only Data Optimized
- Read/Write with Conflict Detection
- Read/Write Data One-to-many

These patterns need additional Entities and attributes to support the synchronization process

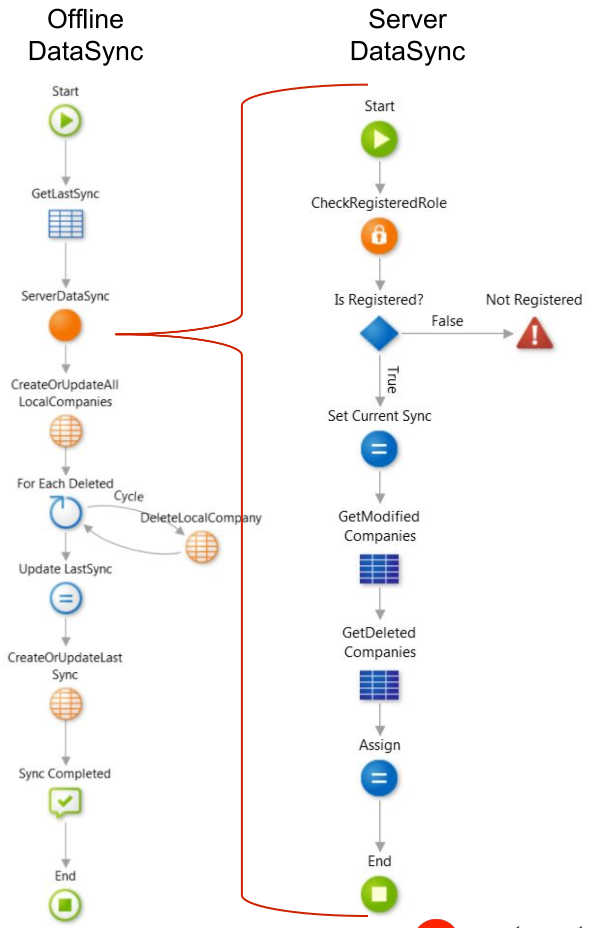
- Save the locally modified records
- Save the last sync timestamp
- Entities for conflicted records



https://success.outsystems.com/Documentation/11/Developing_an_Application/Use_Data/Offline/Offline_Data_Sync_Patterns

Read-Only Data Optimized

- Simple synchronization pattern
  - Server can update data in the database
  - Device does NOT change data in local storage
    - If it does, changes are not sent to the Server
- Synchronization steps
  - Client calls Server with LastSync time
  - Server returns changed & deleted Entities
  - Client updates current local storage Entities
  - Client deletes removed Entities
  - Client update LastSync time
- Only sends changed data (more efficient)



Summary

- Synchronization Actions
- Basic Synchronization Patterns
  - Characteristics
  - Accelerators
  - Read-Only Data
  - Read / Write Last Write Wins
  - Advanced Patterns

Data Synchronization

Basic Patterns

Thank You!