

## Step 1: Handle extensions to support event views

Initial VarHandle implementation depended directly on StoreGateSvc. But handles should work with event view objects too. Extend IProxyDict to include all operations needed by handles (eg, for recording). Then handles can depend only on IProxyDict, which can be implemented by views.

- Remove: `deep_proxy()`, `proxy(CLID)` (use variant with key instead). [Not actually removed yet from the interface, but there should be no callers.]
- Add:

```
SG::DataProxy*
recordObject (std::unique_ptr<DataObject> obj,
              const std::string& key,
              bool allowMods);

StatusCode updatedObject(CLID id, const std::string& key);
```

- Also: Merge functionality of IProxyDictWithPool into IProxyDict. [Still need to remove IProxyDict.]

## Step 2: Hive fixes

Handles are problematic in hive: they cache a DataProxy pointer. But that depends on the event slot, which can change from call to call.

- Original version didn't clear the proxy, which is wrong. (Only worked because the only handle method that was actually used was a record method that didn't use the cached proxy.)
- As part of step 1, handle reset changed to clear proxy pointer.
- Caused problems: when reset is called from the event loop, the algorithm containing the handle instance may be processing a different event.
- In Hive mode, need to clear out handle at the end of the algorithm. But don't want to spoil caching in single-threaded jobs.

## Step 2: Hive fixes

### Solution:

- Distinguish 'hard' reset from a 'soft' reset by adding a boolean flag to `reset()`. On a hard reset, the event slot may be changing, so the proxy pointer needs to be cleared. A hard reset will be sent from SG if there's more than one active event slot.
- When a handle is bound to an object, the handle calls SG to put it on a list. SG then calls `reset` on this list when the store is cleared.
- In Hive, we were already calling at the end of each algorithm (via an auditor) `StoreGateSvc::commitNewDataObjects`. Extended this so `reset` all handles that were added since the last call to `commit`.
- The reset will then remove then handle from the store's list of handles.

# Stateless handles?

Maybe we would be better off just making handles stateless?

- Does giving up the caching hurt performance?
- Probably not really, if we're just accessing the handle once per algorithm/event.
  - ▶ But don't want to do it within loops.
- Algorithms could fetch the pointer from the handle into a local at the start of execution.
  - ▶ But in that case, perhaps it's more natural to access it by calling an explicit method, rather than treating the handle as a pointer.
- But is it then so different from `retrieve()`?