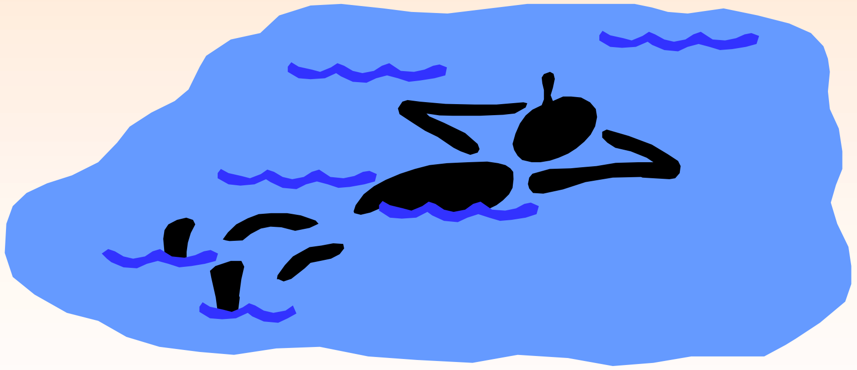
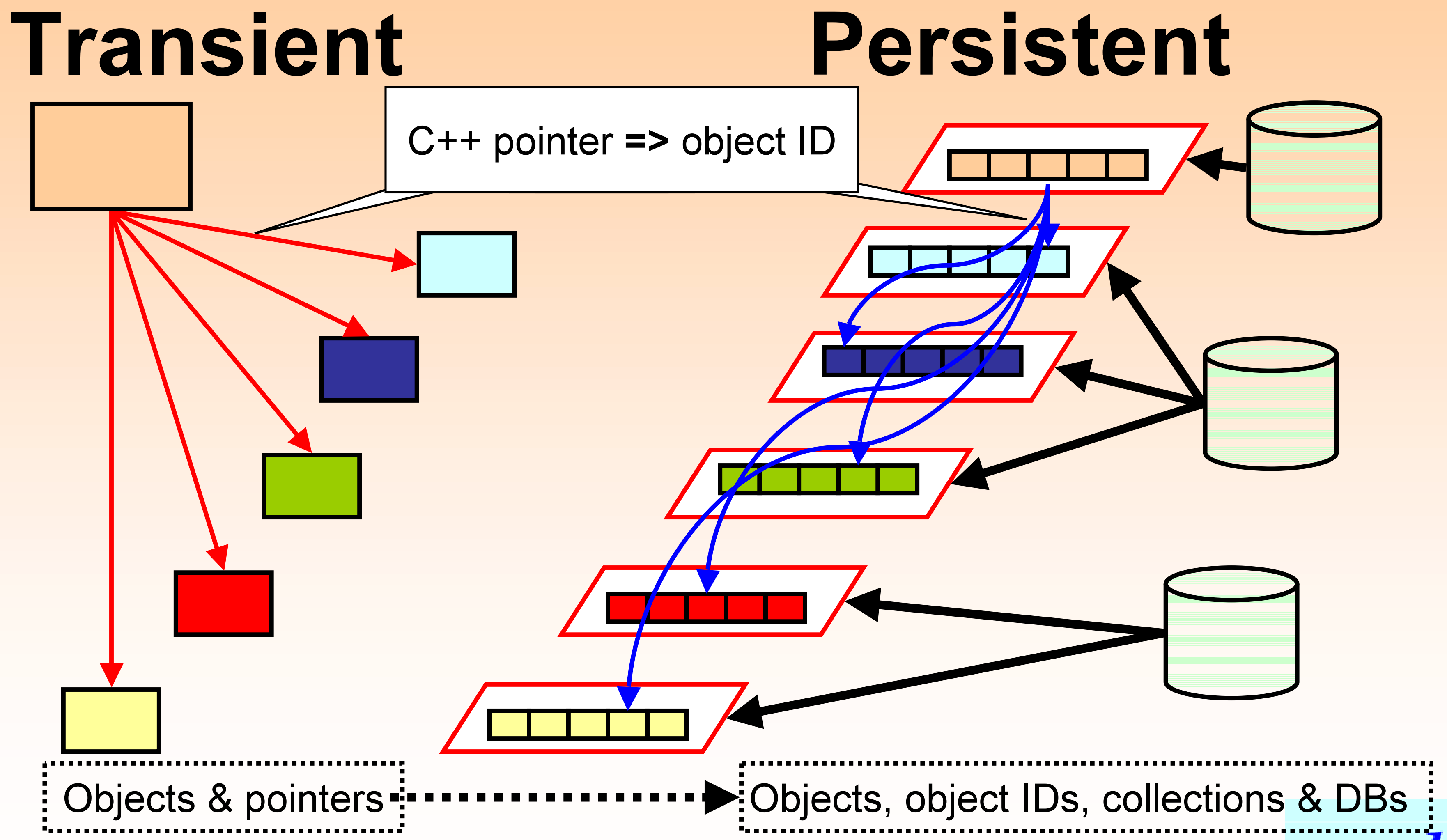
POOL persistency: Status

- Current understanding
- Today's model
- Conclusions

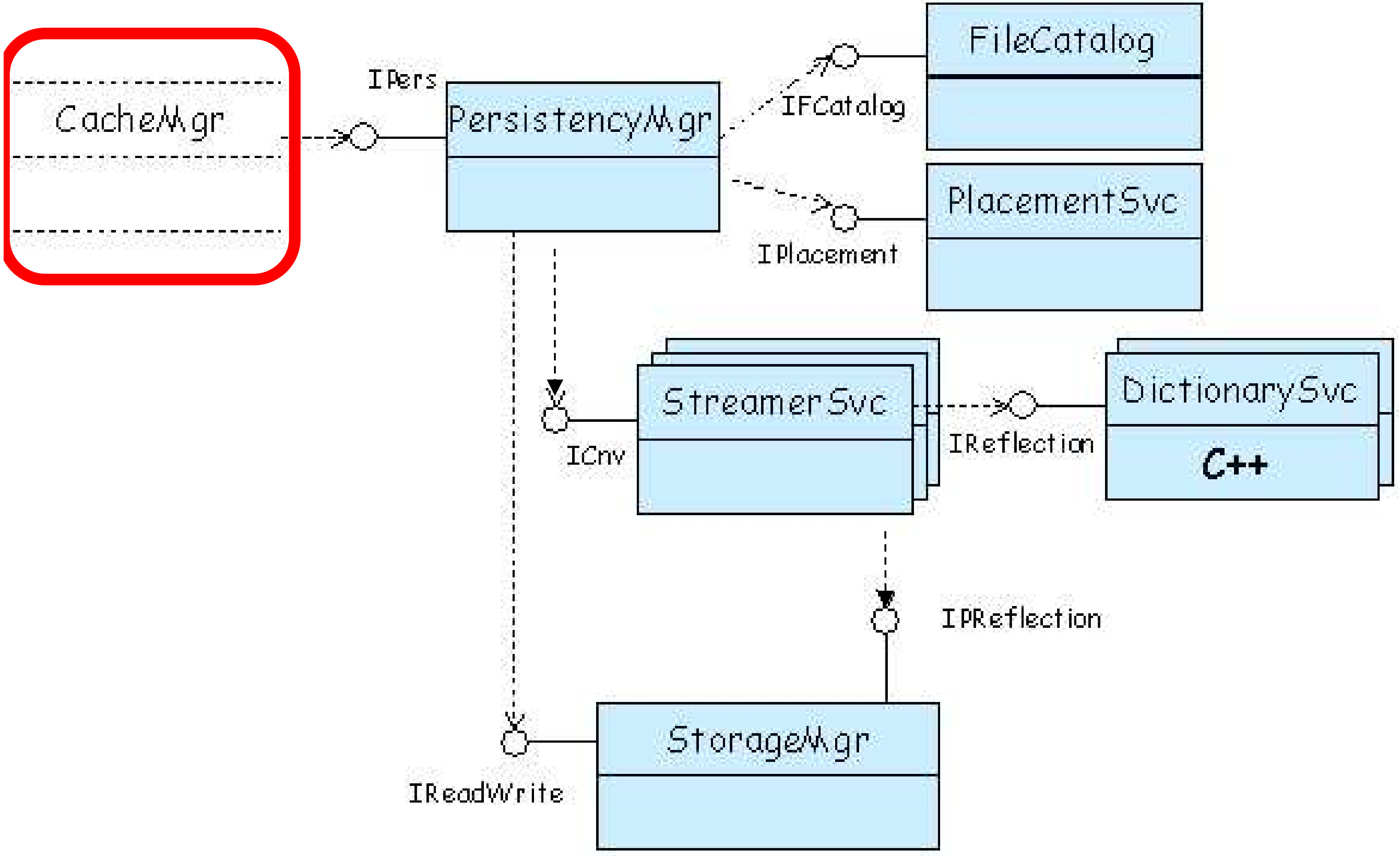


M.Frank LHCb/CERN

Persistency – What is it about?

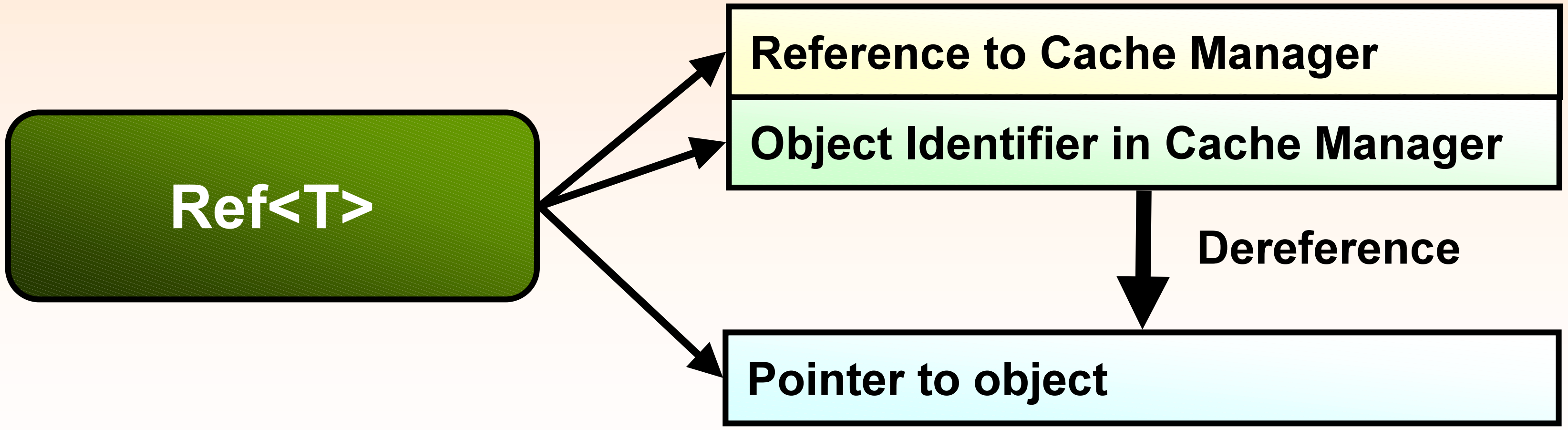


The Object Model (June)

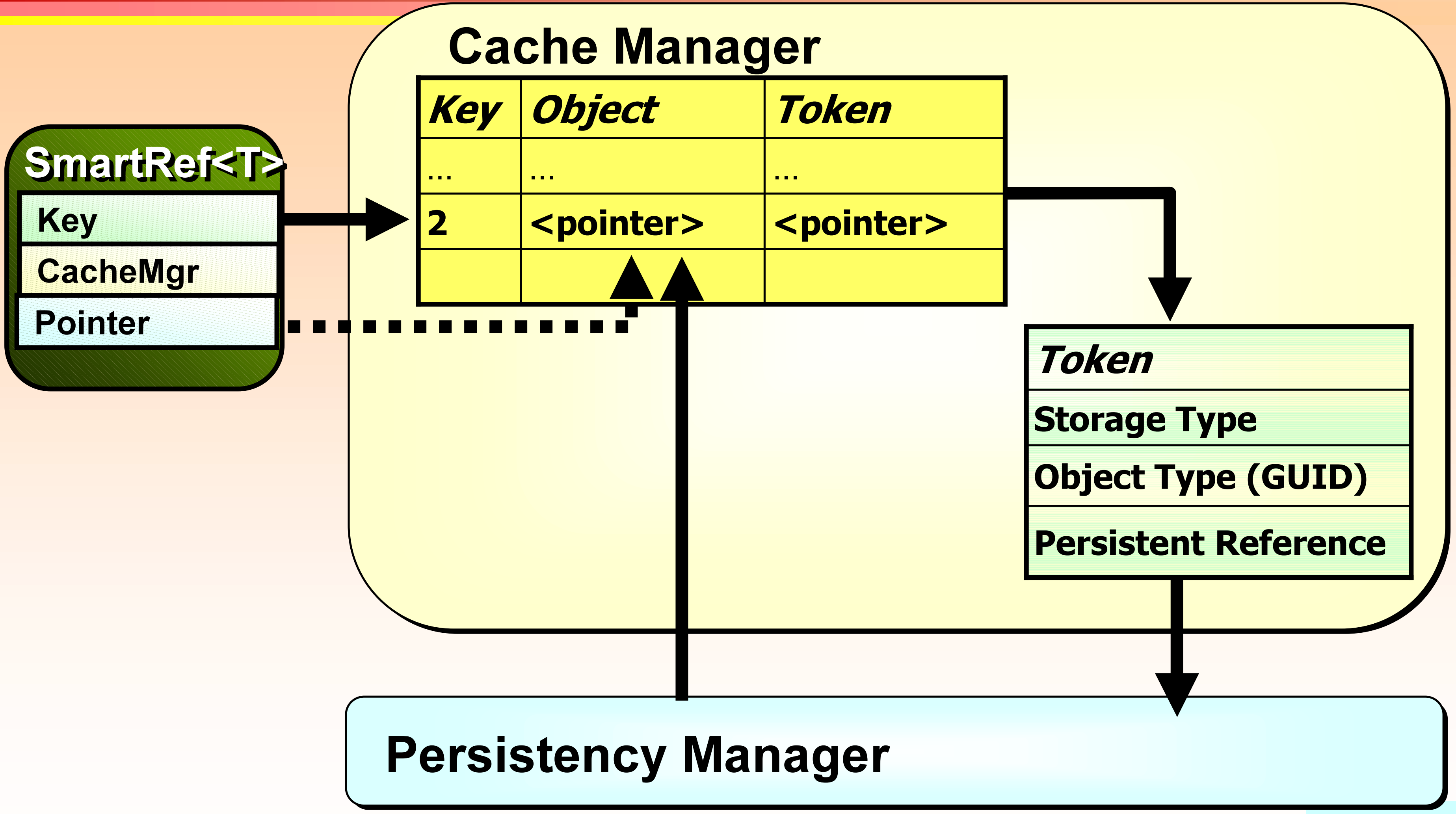


Cache Access Through References

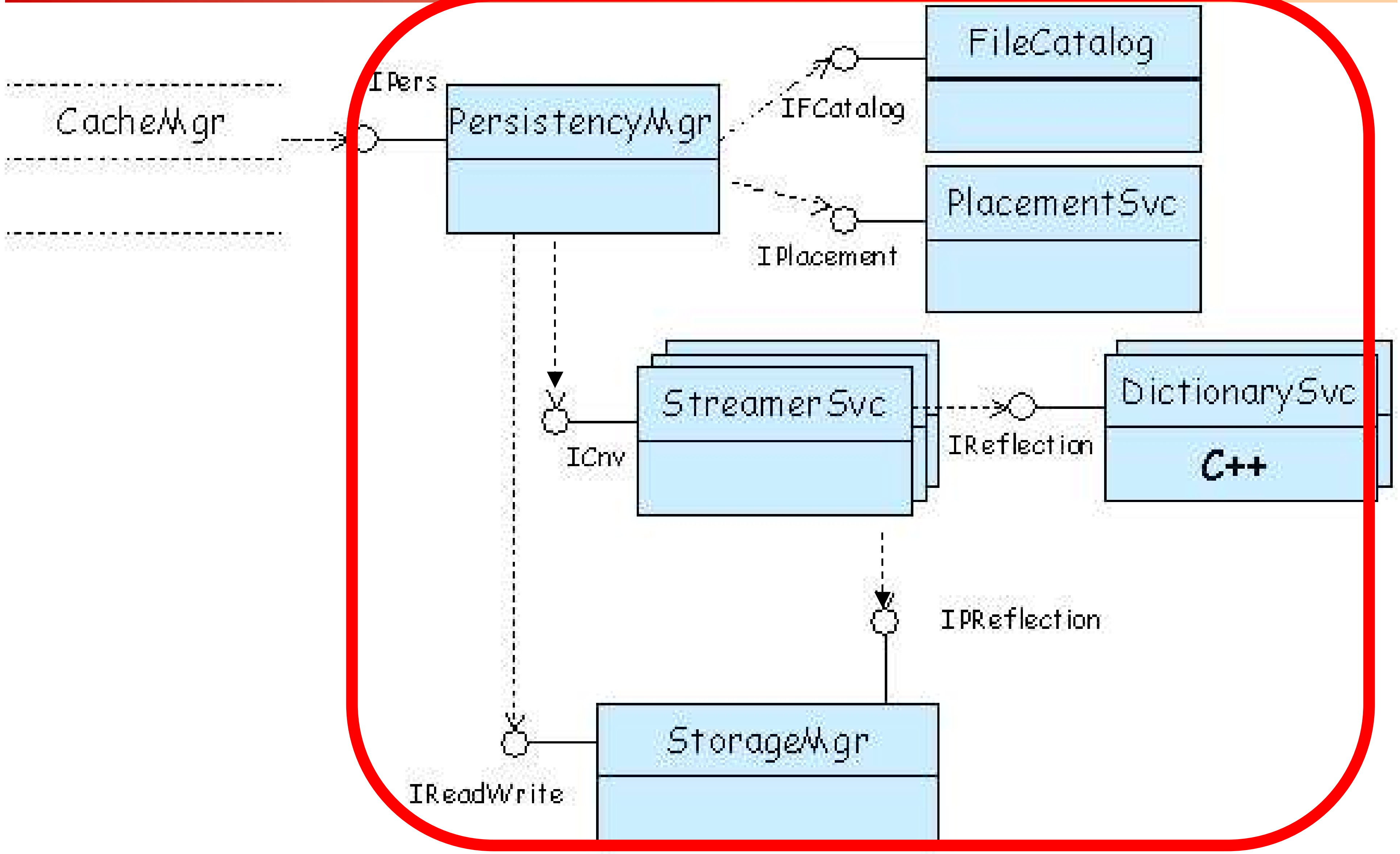
- References know about the Cache Manager
- References are implemented as smart pointers
  - Use cache manager for “load-on-demand”
  - Use the object key of the cache manager


Ref<T>
Reference to Cache Manager
Object Identifier in Cache Manager
Dereference
Pointer to object

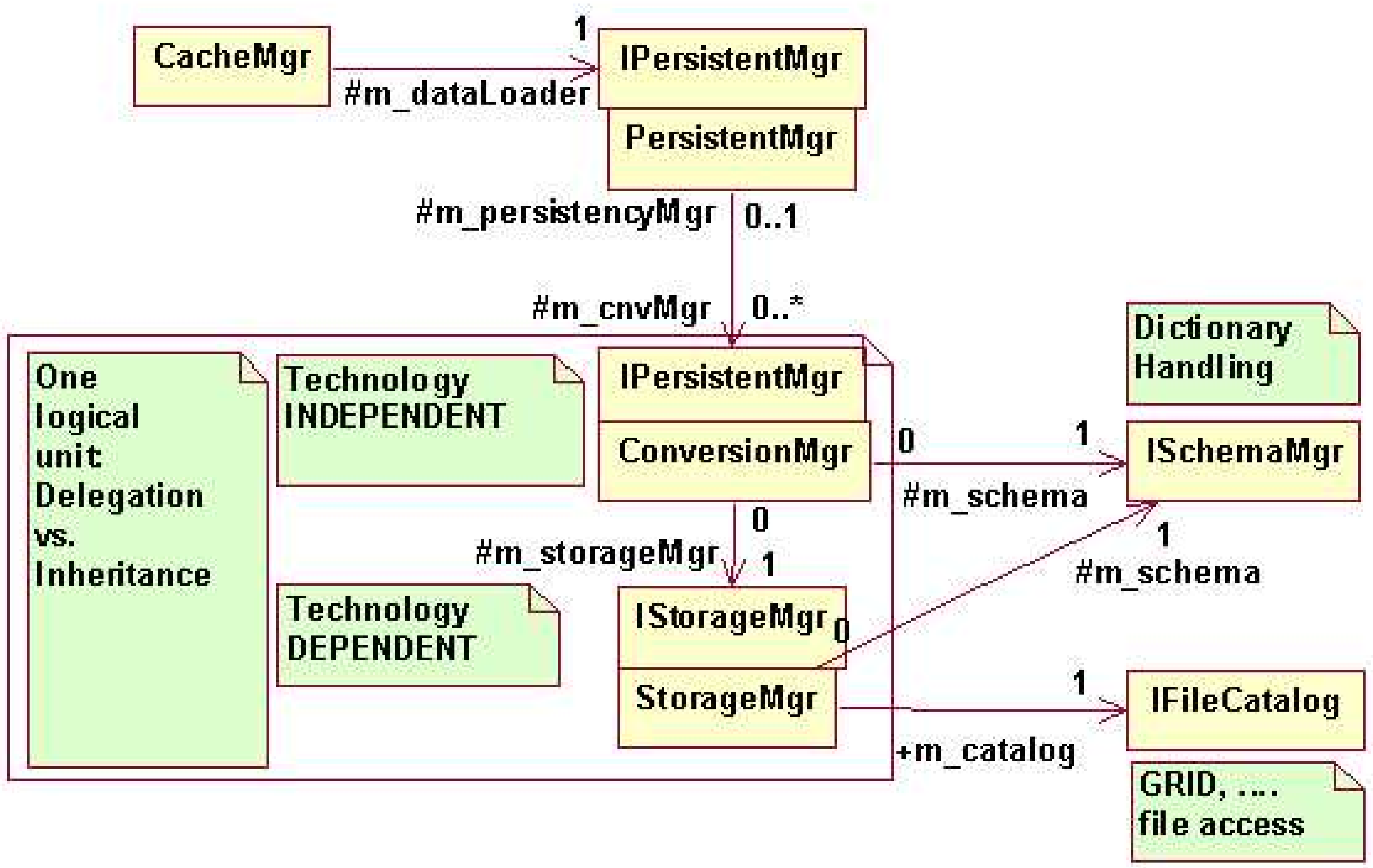
Cache Access



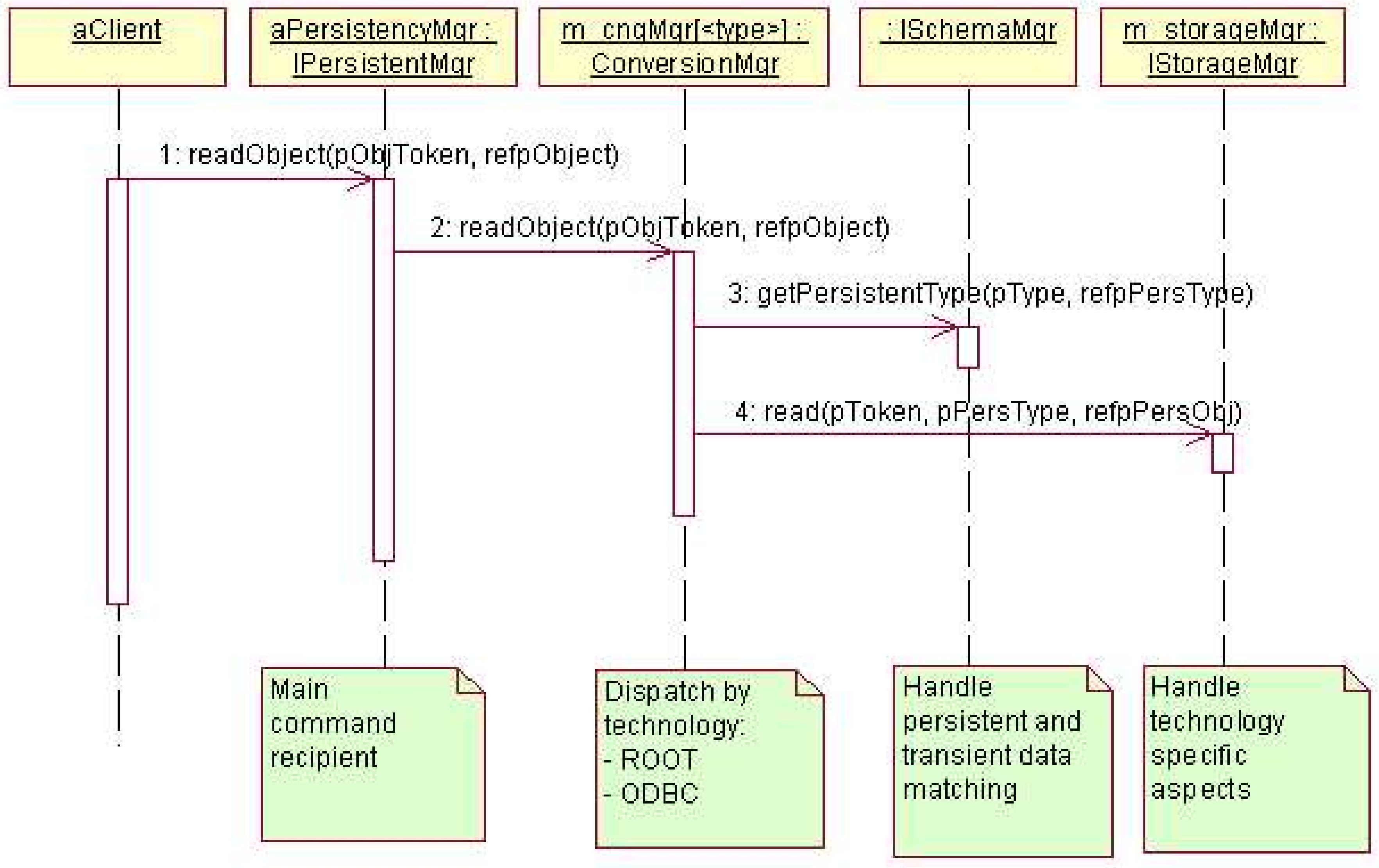
The Object Model (June)



Class Diagram of Today



Typical Calling Sequence


aClient
aPersistencyMgr : IPersistentMgr
m_cnqMgr[<type>] : ConversionMgr
: ISchemaMgr
m_storageMgr : IStorageMgr
1: readObject(pObjToken, refpObject)
2: readObject(pObjToken, refpObject)
3: getPersistentType(pType, refpPersType)
4: read(pToken, pPersType, refpPersObj)
Main command recipient
Dispatch by technology: - ROOT - ODBC
Handle persistent and transient data matching
Handle technology specific aspects

Persistency Interface

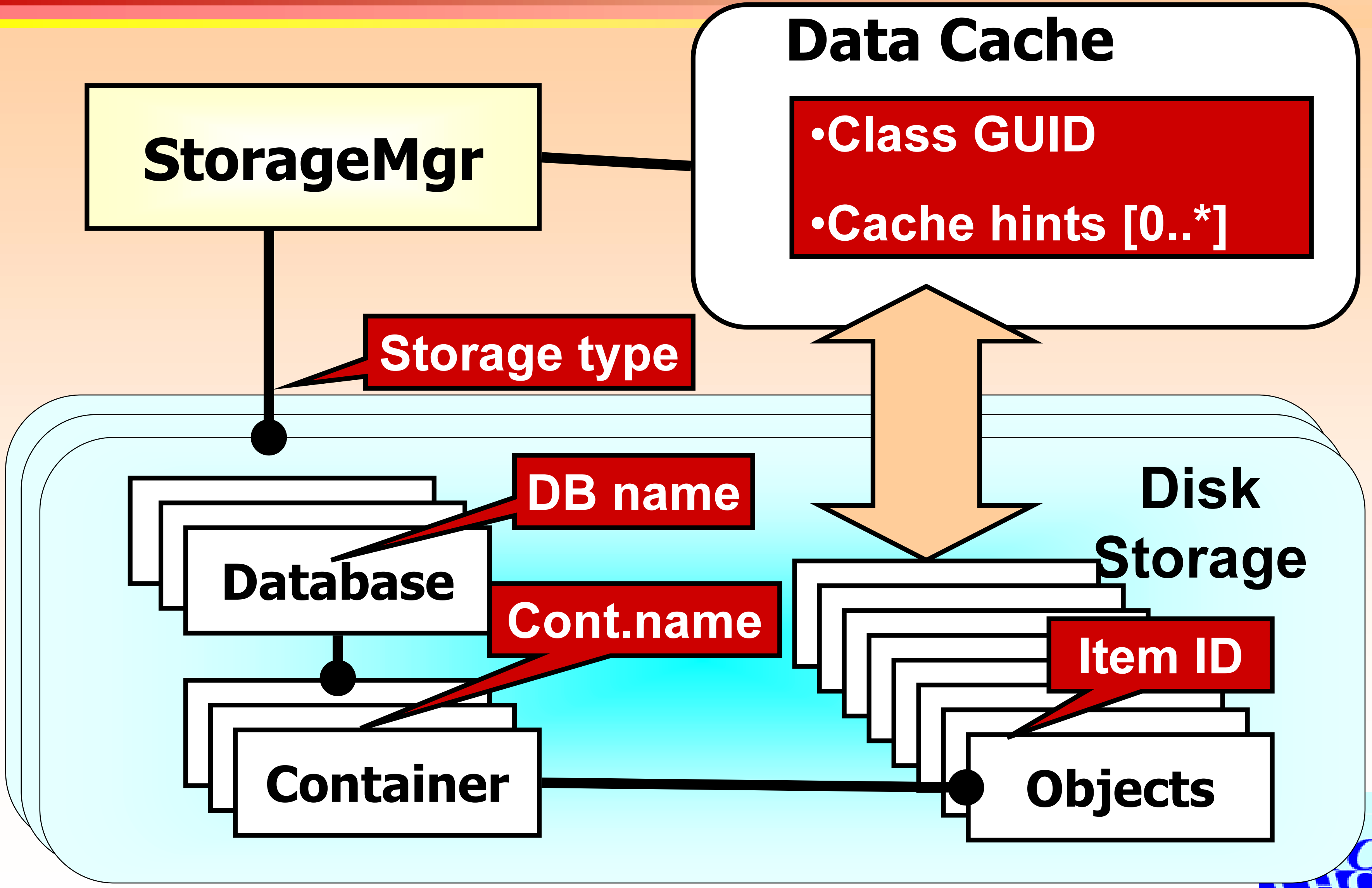
- Read Object access
  - readObject
- Transaction handling
  - Start, commit, rollback
- Register objects for writing

Writing Objects

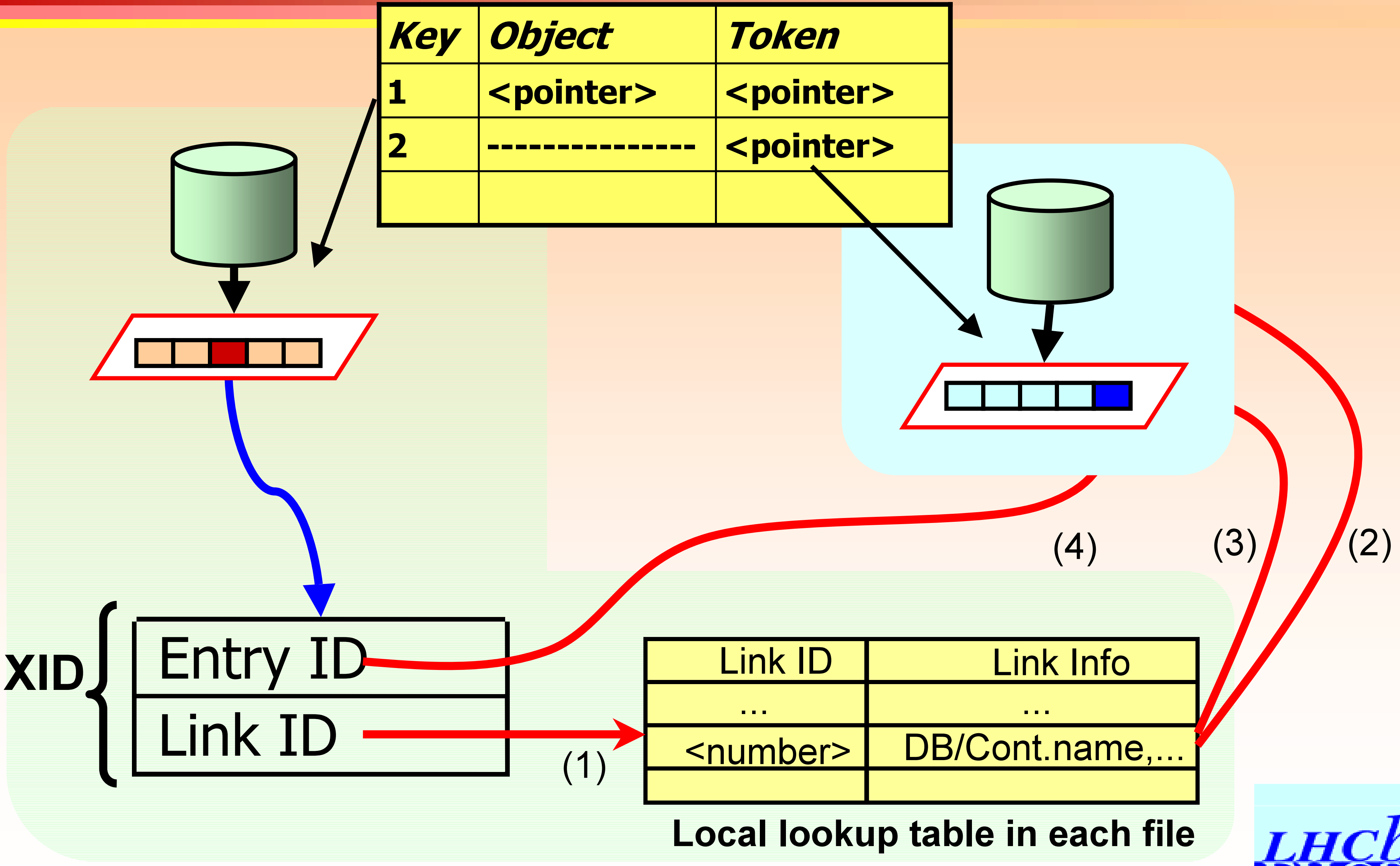
- **Supported by IPersistencyMgr**

- Start transaction
- Loop 1 … n
  - Mark objects for write: requires placement hint
- End Transaction
  - Commit
  - Rollback (if supported by database)

Model Assumptions



Follow Persistent References



Key	*Object*	*Token*
1	<pointer>	<pointer>
2	---------------	<pointer>

Link ID	Link Info
...	...
<number>	DB/Cont.name,...

Local lookup table in each file

The Link Table

- Contains all information to resurrect an object

Storage identifier	INT
Database “name”	string
Container name	string
Class identifier	GUID
Cache hints	string []

  - E.g. other possible transient conversions

Make sure the object model does not go wild!

Conclusions

- I think this model could work very nicely for any persistency technology based on database files, collections and objects within collections
- The main thinking is done
- Think about some optimizations,
  which cannot be introduced later
- Looks like it's about time to start prototyping

Persistent Objects

What is the default?

- Objectivity, OOCI:
  - Everything is persistent unless deleted before commit
- ROOT, RDBMS:
  - Nothing is persistent unless explicitly saved
  - ROOT: Tobject::Write(), Ttree::Fill() etc.
  - RDBMS: INSERT INTO <table> VALUES (…)
- …has consequences on allocation mechanism

Persistent Object Allocation

First possibility:

- During "Mark objects for write"
  - In registerObjectForWrite(…)
    - Client can know immediately if object can be written
    - Better handle for corrective actions
    - Create persistent token
  - In endTransaction(…)
    - Fill data, resolve references and update row

"unregisterObjectFromWrite" difficult

Transaction may be open for a long time

Persistent Object Allocation

Second possibility:

- During “End Transaction”
  - In markObjectForWrite(…)
    - Trivial. Simply collects object pointers
    - “unregisterObjectFromWrite” trivial
  - In endTransaction(…)
    - Create persistent token
    - Fill data, resolve references and update row

Only bulk transaction/conversion status

On failure drop all