LHCb s/w week

25/5/2005

Conditions DB & Update Manager status and plans

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Overview

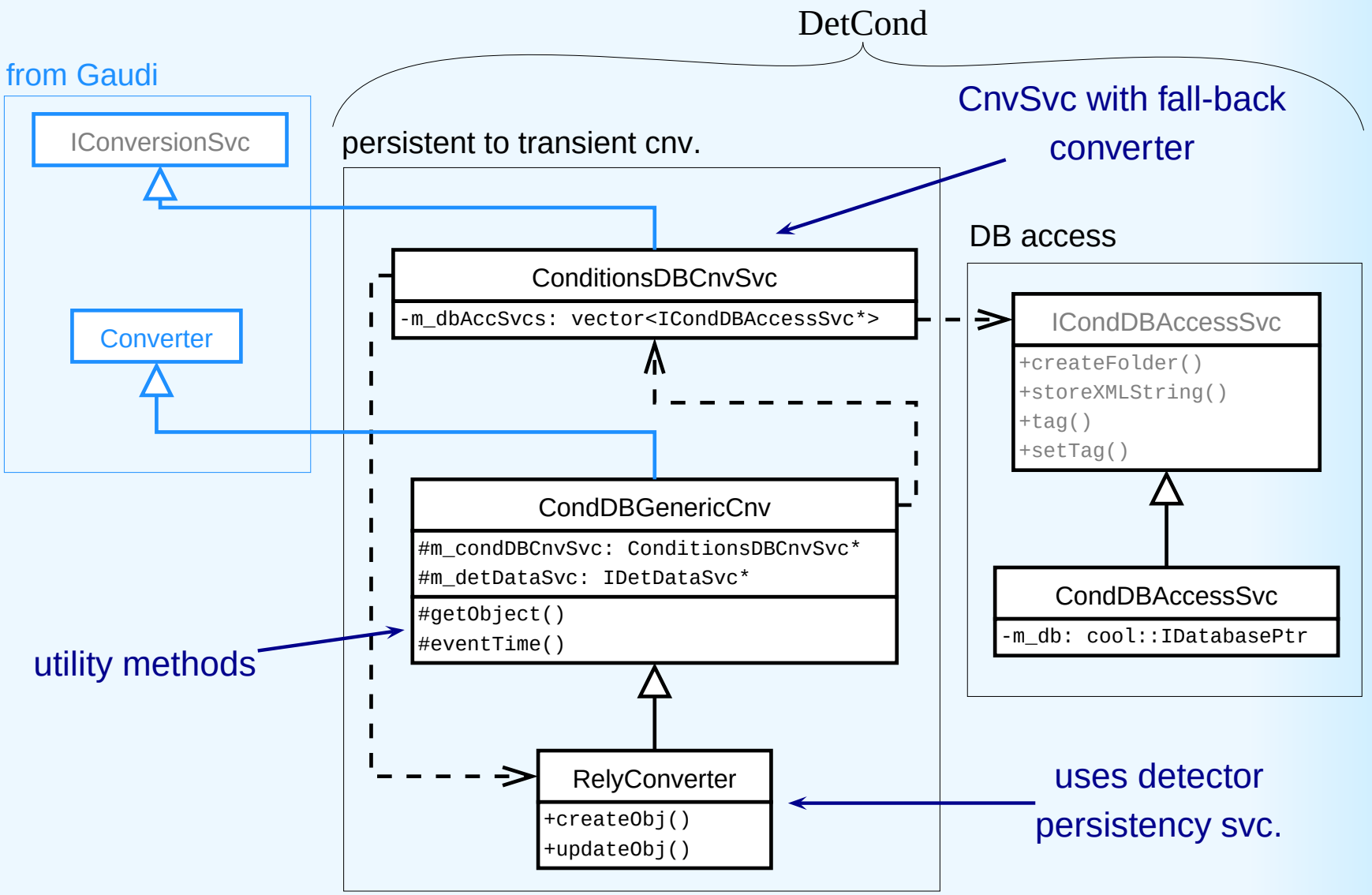
- Main new features
  - DetCond package
    interface to COOL
  - Update Manager Service
  - DetCondExample package
- Conclusions
  - Summary
  - Plans / missing features

DetCond

DetCond: principles

- Requirements:
  - Gaudi-integrated way of using COOL
  - simplify user–DB interaction
  - use more than one DB instance
    (local copy for testing + master DB)

DetCond: layout



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  - encapsulate object retrieval
    tries the acc. services known by ConditionsDBCnvSvc
- RelyConverter
  - ask DetectorPersistencySvc to convert the string got from CondDB
    currently only XML strings supported

DetCond: main features (2)

- (I)CondDBAccessSvc
  - connection to COOL API
  - database handling
    - folder creation
    - object storage
    - tagging

DetCond: how does it work

Example options:

```
ApplicationMgr.ExtSvc += {"ConditionsDBCnvSvc",
                          "CondDBAccessSvc"};
DetectorPersistencySvc.CnvServices +=
                          {"ConditionsDBCnvSvc"};
CondDBAccessSvc.HostName = "conddbhost.cern.ch";
CondDBAccessSvc.User = "conddb";
CondDBAccessSvc.Password = "*****";
CondDBAccessSvc.Database = "LHCB";
CondDBAccessSvc.Schema = "COOL";
CondDBAccessSvc.TAG = "production_v1";
CondDBAccessSvc.BackEnd = "mysql";
```

DetCond: how does it work

Example options:

load needed services

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ApplicationMgr.ExtSvc += {"ConditionsDBCnvSvc",
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DetCond: how does it work

Example options:

add the new cnv. service

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DetCond: how does it work

Example options:

set connection parameters

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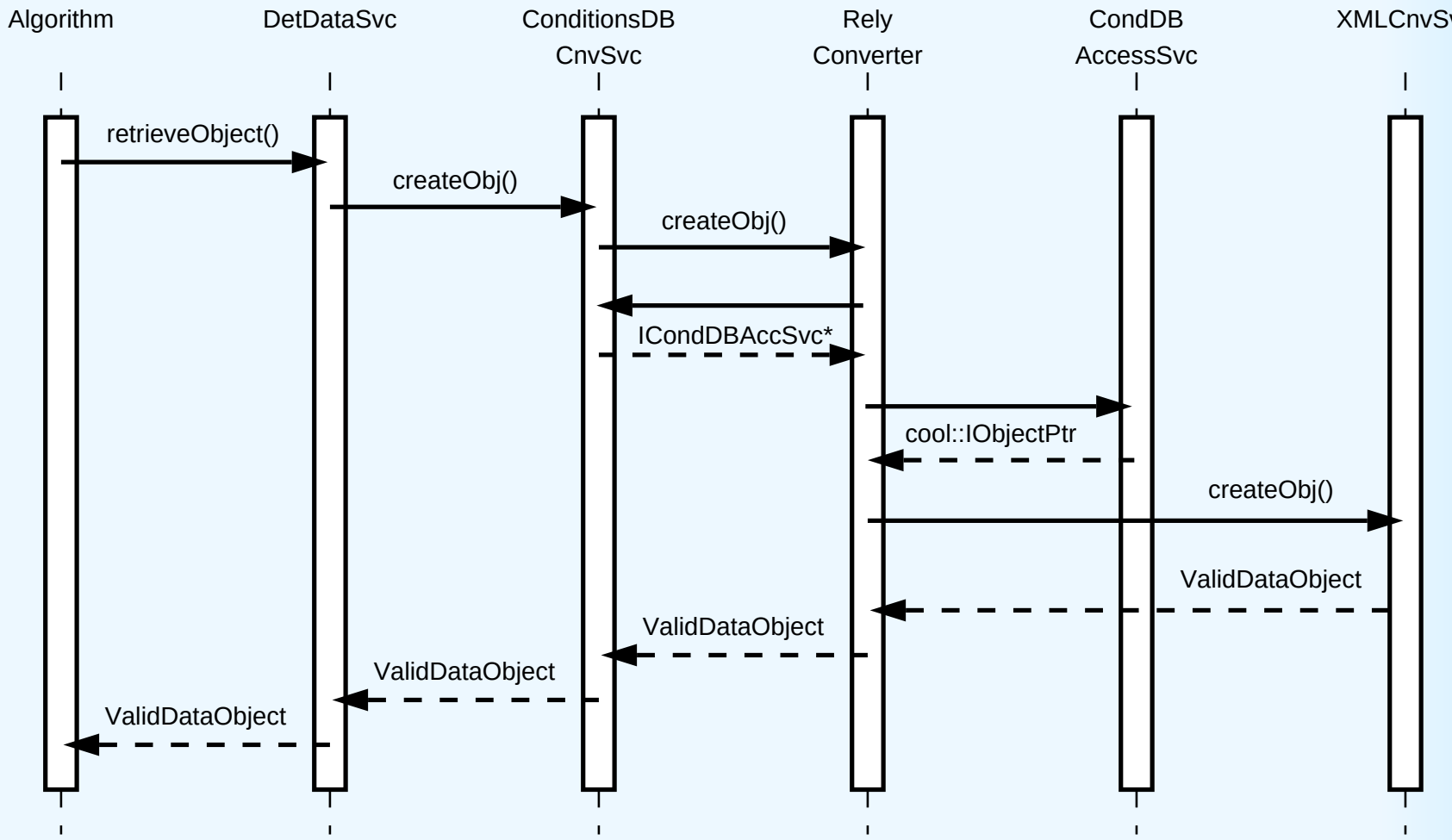
DetCond: how does it work (2)



Appropriate IOpaqueAddress generated by XMLCnvSvc for tags like:
<*whatever* ref href="conddb:/path/to/object#name">

DetCond: how to populate a DB

- you need an access svc

```
ICondDBAccessSvc *accSvc;
StatusCode sc =
   serviceLocator()->service("CondDBAccessSvc",accSvc);
```

- create your folders

```
accSvc->createFolder("/path/to/the/cond","comment",
                     ICondDBAccessSvc::XML);
```

- create conditions

```
Condition myCond;
myCond.addParam<double>("temperature",25.3);
```

- store it

```
accSvc->storeXMLString("/path/to/cond",myCond.toXml(),
                       TimePoint(0),TimePoint(10));
```

DetCond: how to use 2 DBs

- Options:

```
ApplicationMgr.ExtSvc += { "ConditionsDBCnvSvc" };
ApplicationMgr.ExtSvc += { "CondDBAccessSvc/DB1" };
ApplicationMgr.ExtSvc += { "CondDBAccessSvc/DB2" };

ConditionsDBCnvSvc.CondDBAccessServices =
                                        { "DB1", "DB2" };

DB1.HostName = "dbhost1";
// ...
DB2.HostName = "dbhost2";
// ...
```

DetCond: how to use 2 DBs

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DetCond: how to use 2 DBs

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UpdateManagerSvc

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- We cannot go to the DB every event 
- We need something
  - *automatic*: make life simple for users
  - *efficient*: minimum # of useless operations
  - *flexible*: handle many use cases

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We need an UpdateManagerSvc!

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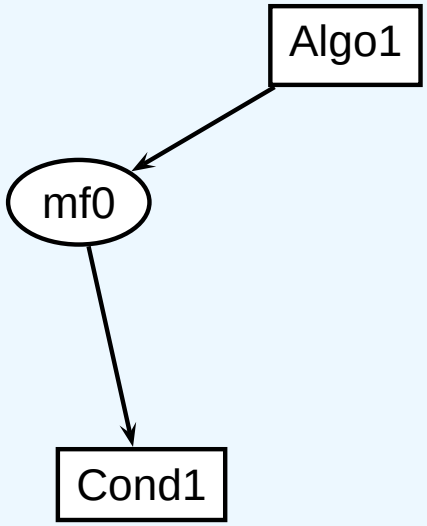
- be dynamically populated (and always consistent)
- allow users to trigger an update of all the items that depend on a condition
- be efficient (of course )

UMSvc: an example

Algo1

UMSvc: an example



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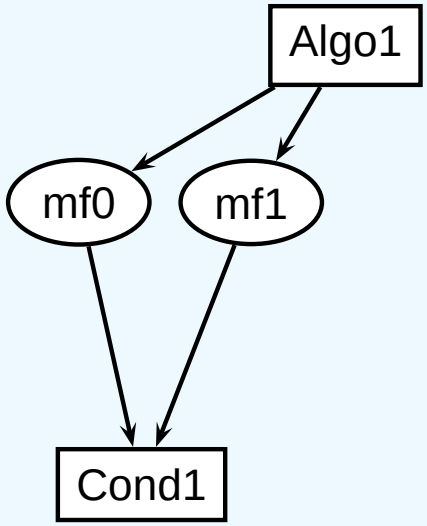

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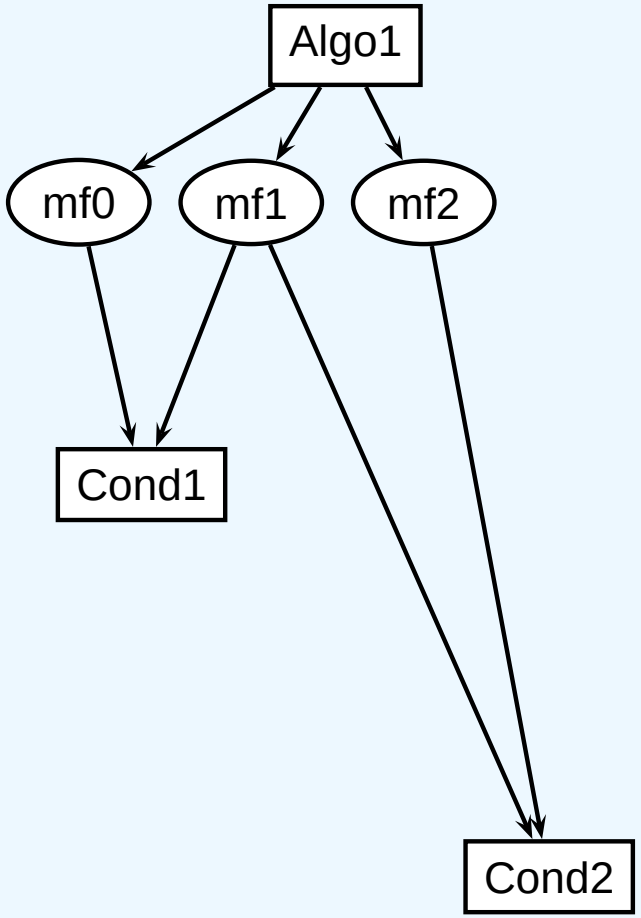

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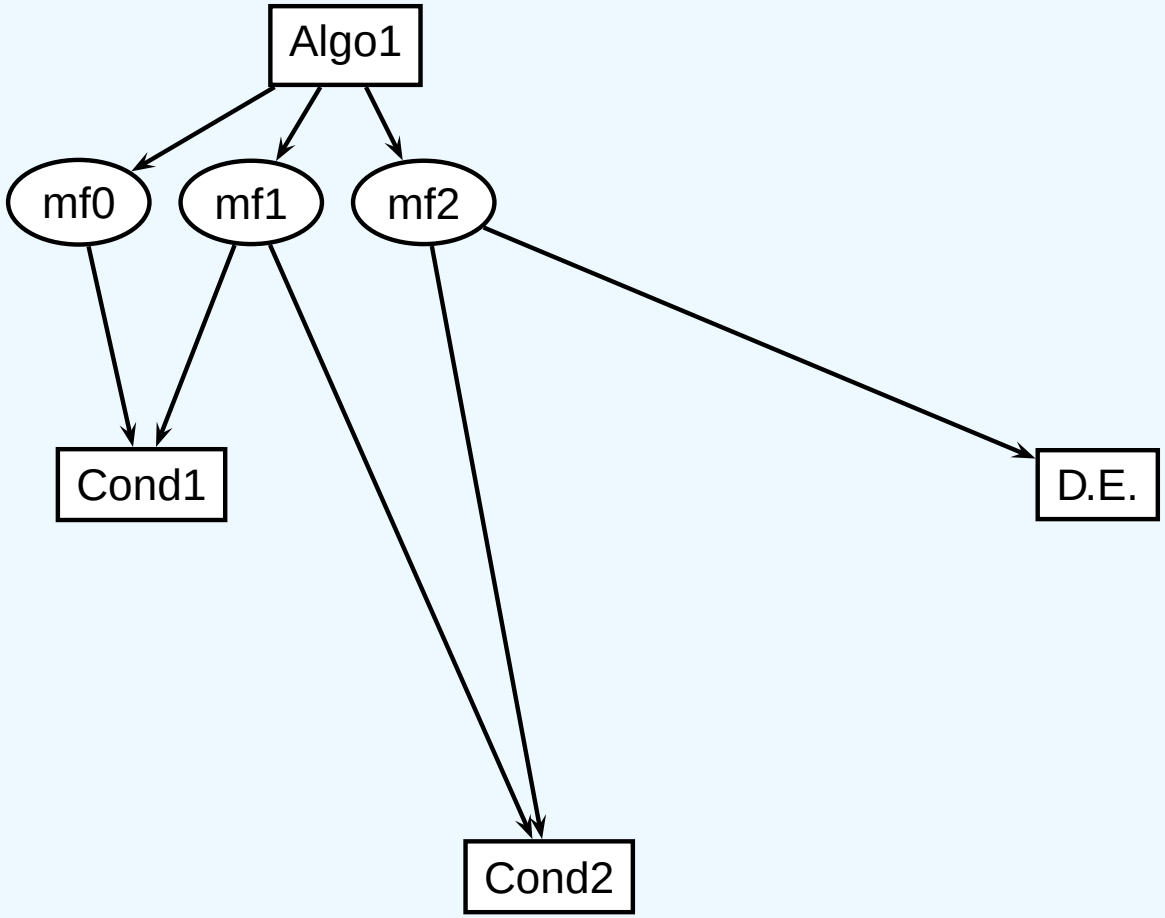

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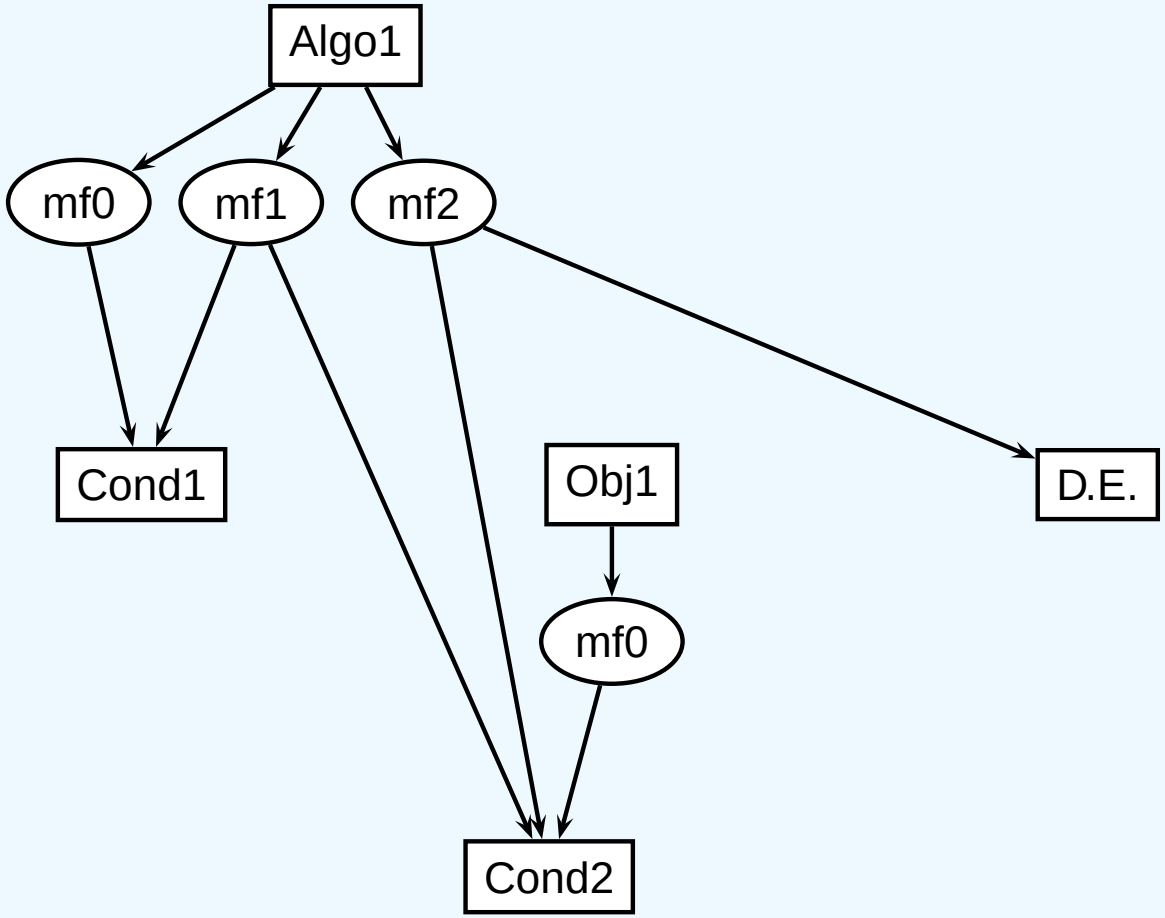

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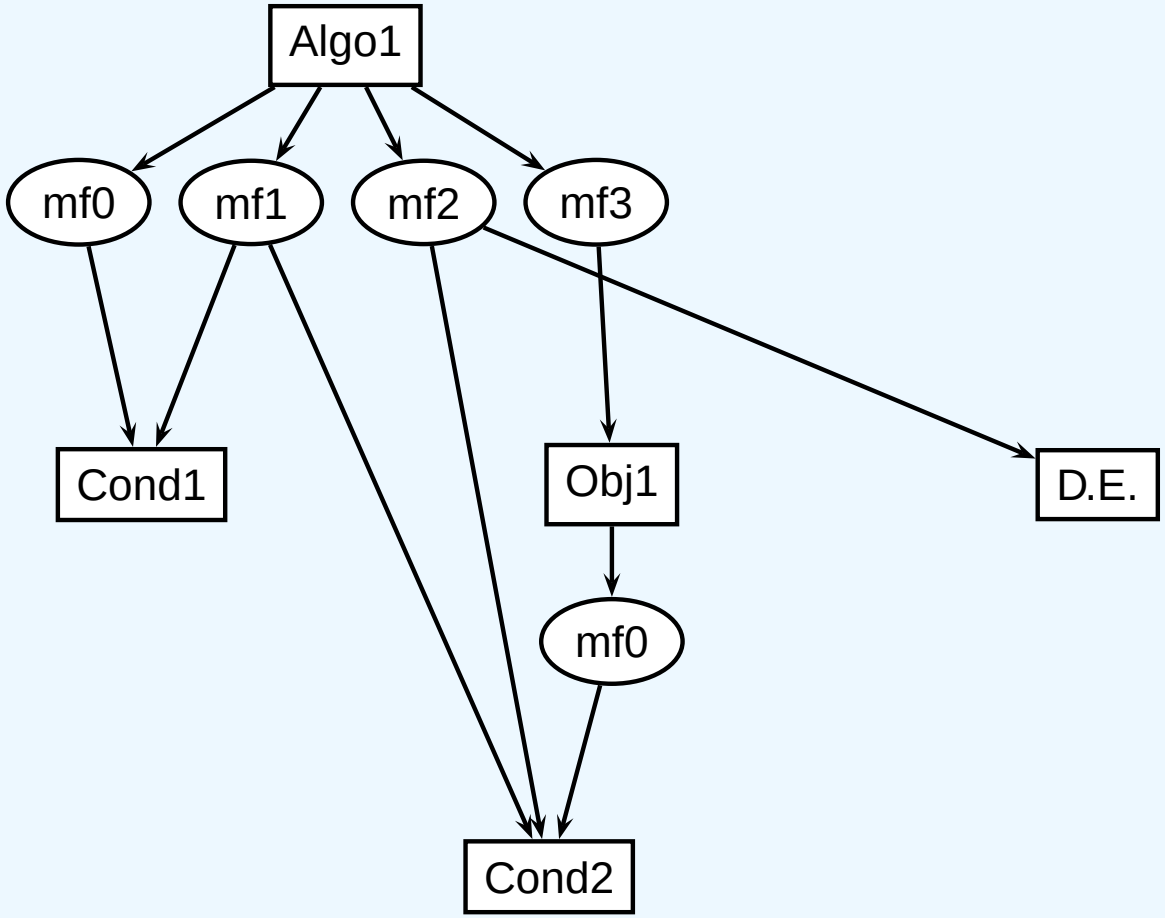

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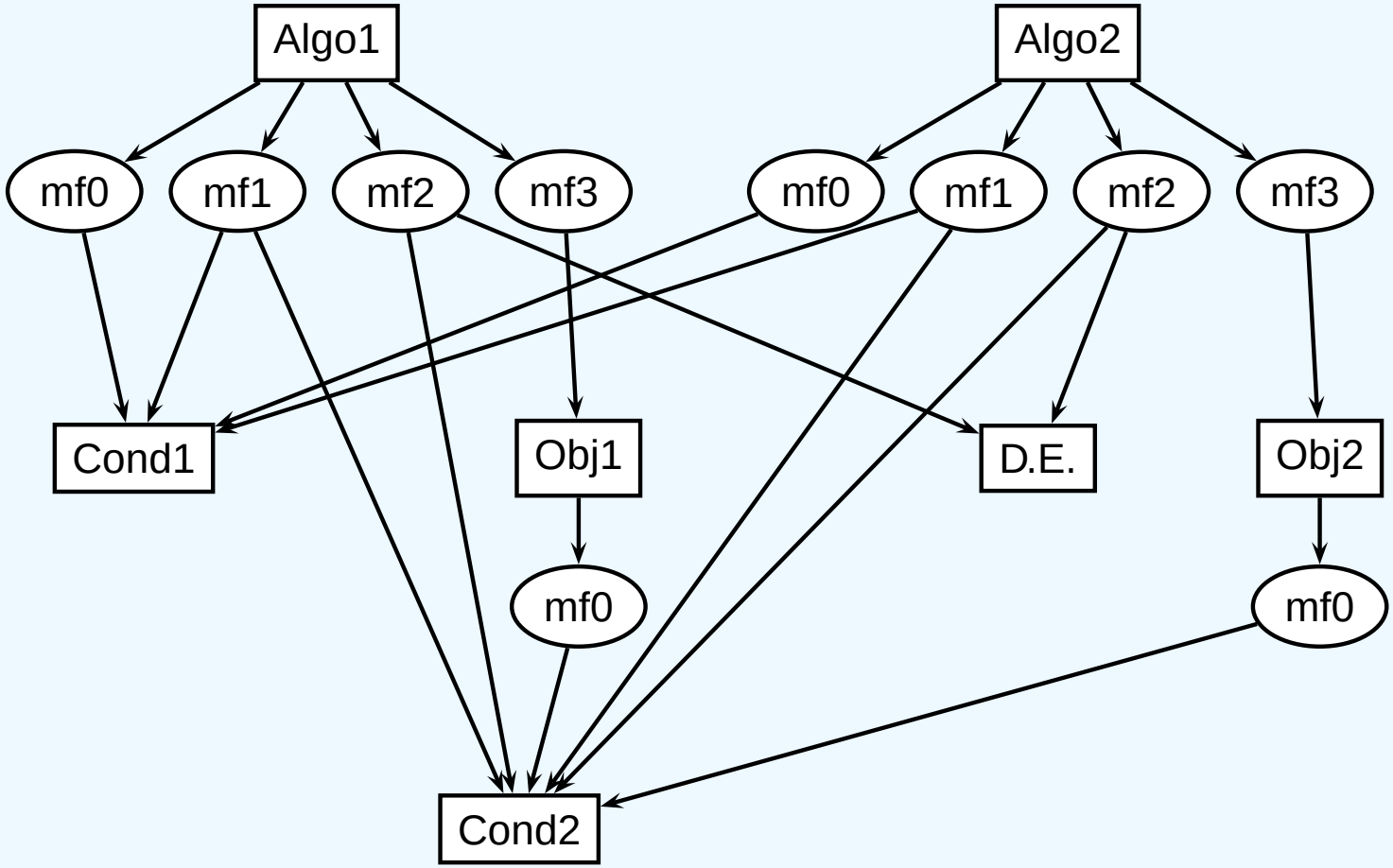

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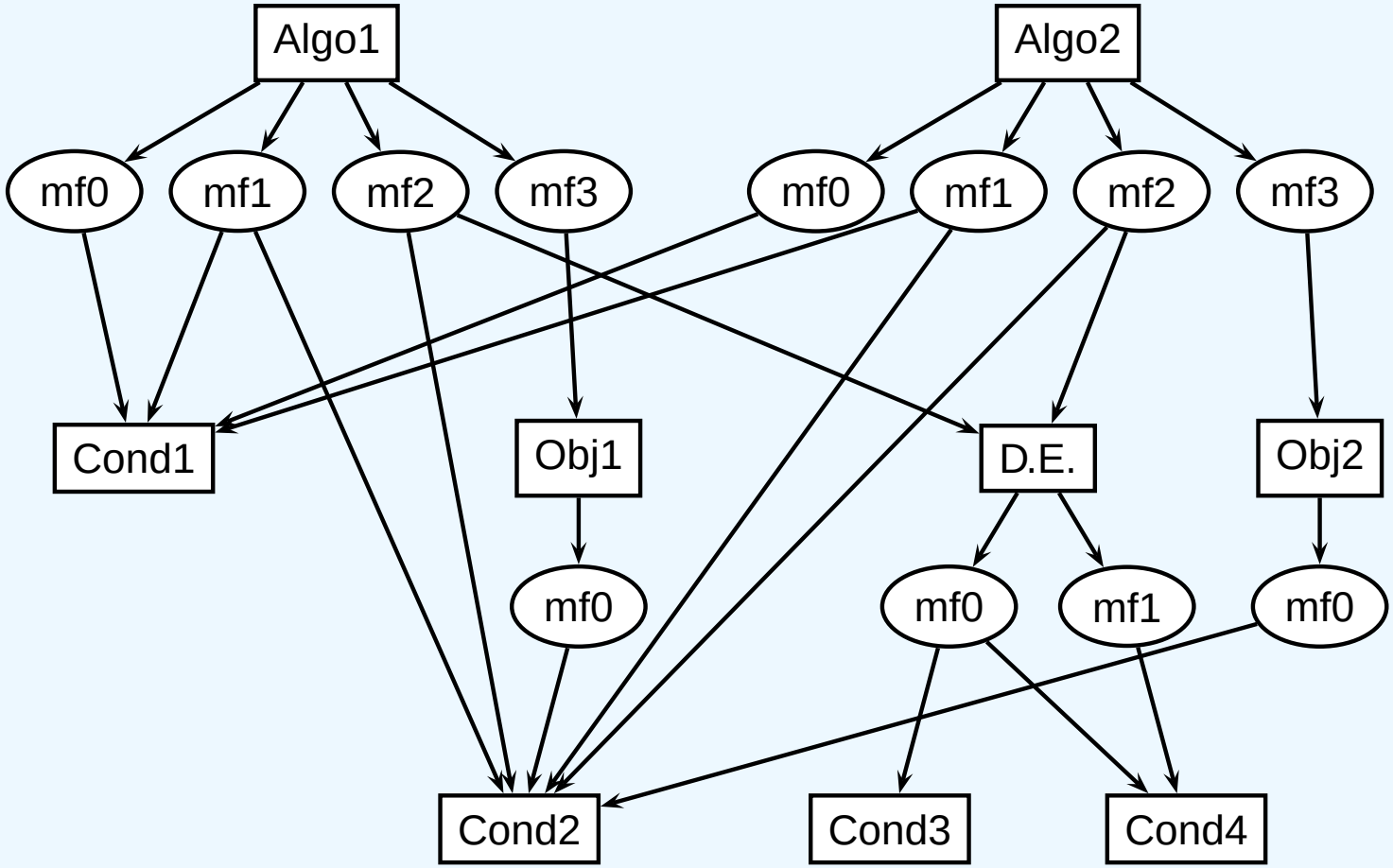

UMSvc: interface

- How to allow users to do different things when different conditions change?
  - let them use their own methods
    (needs templates $\rightarrow$ no pure abstract interface)
  - force them to fill a predefined routine + a switch
    (pure abstract interface, common interface)

UMSvc: interface

- How to allow users to do different things when different conditions change?
  - let them use their own methods (needs templates → no pure abstract interface)
  - force them to fill a predefined routine + a switch (pure abstract interface, common interface)

I prefer the first approach! 

- IUpdateManagerSvc:
  - public template methods that call protected abstract methods

UMSvc: validity

- Simple case: object depending on conditions
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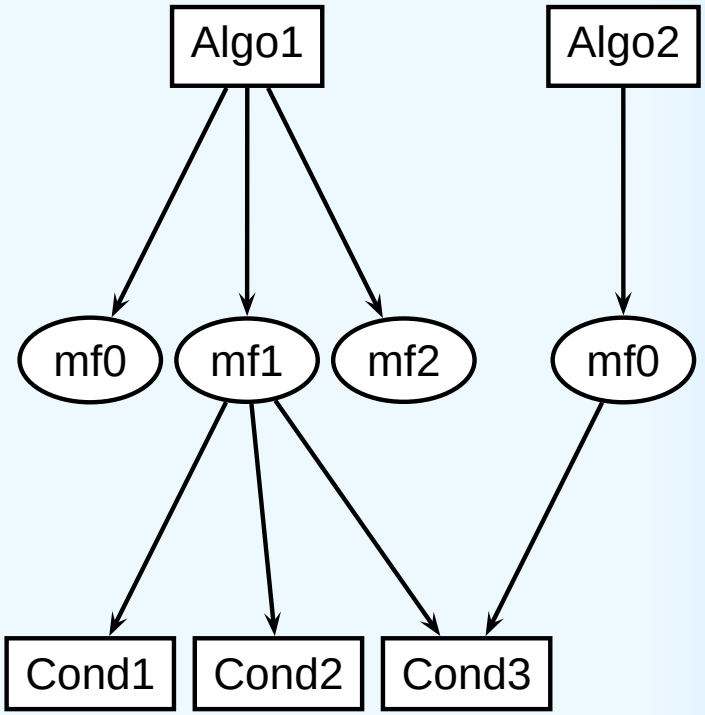
UMSvc: validity

- Simple case: object depending on conditions
  - object IOV is the intersection of cond. IOVs
- More complex: condition depending on conditions
  - the parent cond. has its own *intrinsic* IOV
  - parent IOV is the intersection of intrinsic IOV and child ones
- Most complex: parent needs many methods (>1)
  - each method depend on many conditions
    - intersection of IOV at method level
  - many methods per object
    - intersection of IOV at object level

UMSvc: navigation

Given a dependency network:



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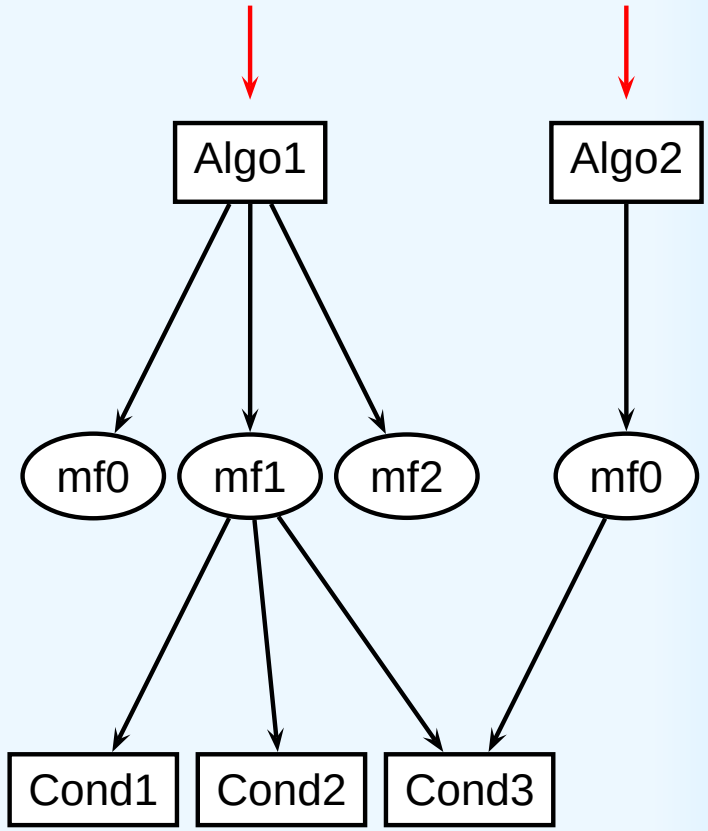

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Given a dependency network:

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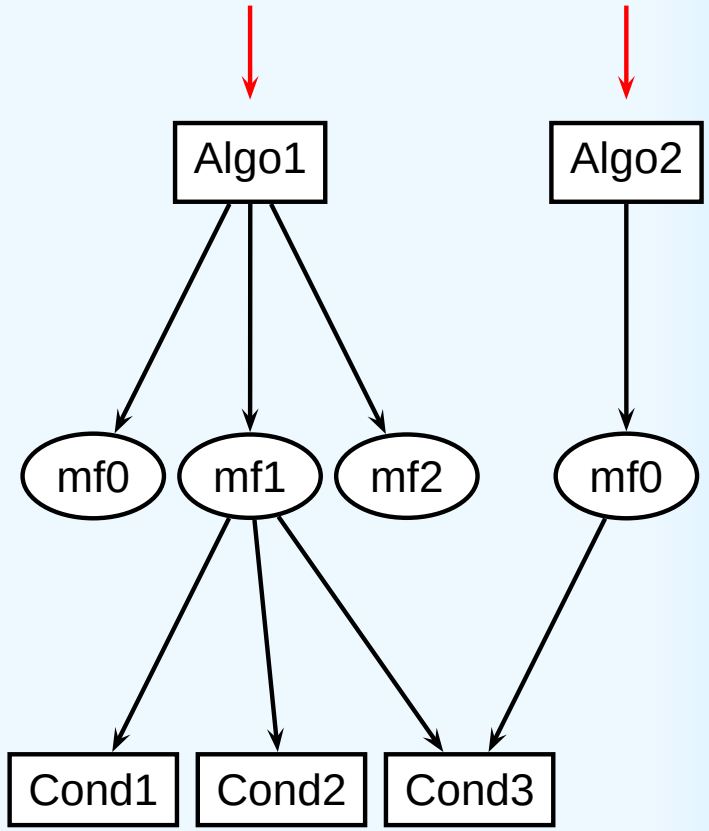

UMSvc: navigation

Given a dependency network:

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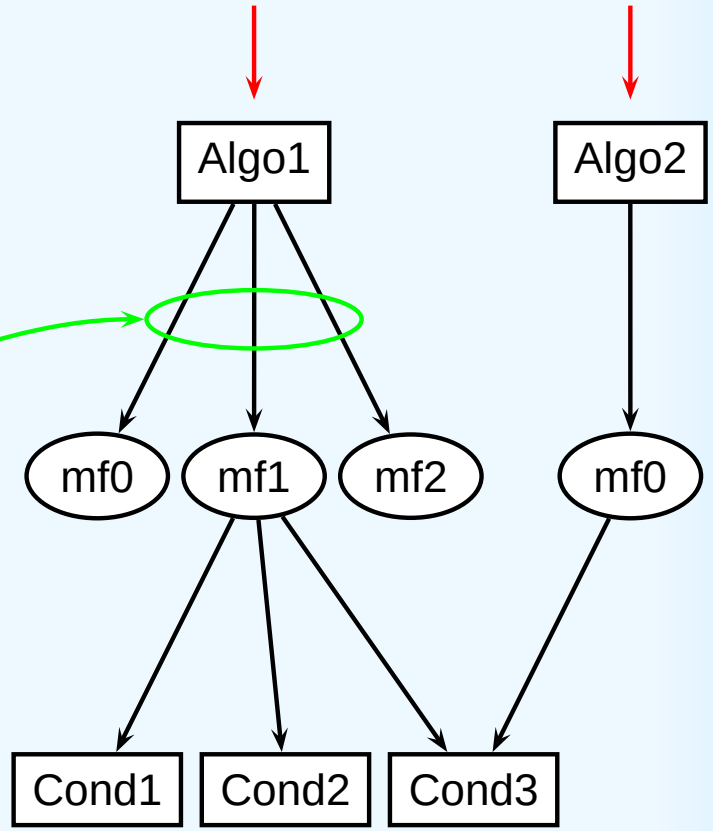
- intersection of validities
  - object level (methods)



UMSvc: navigation

Given a dependency network:

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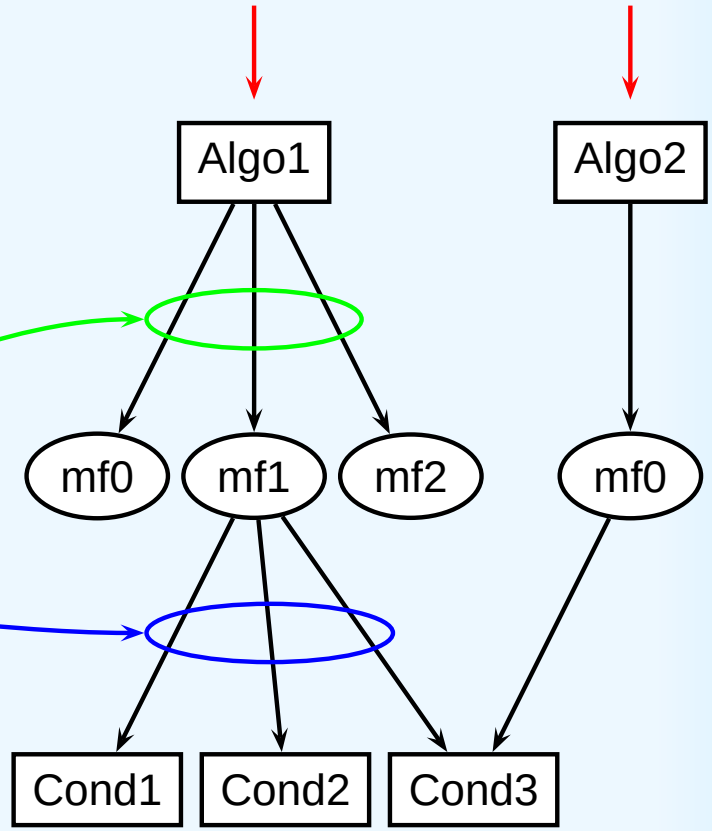

UMSvc: navigation

Given a dependency network:

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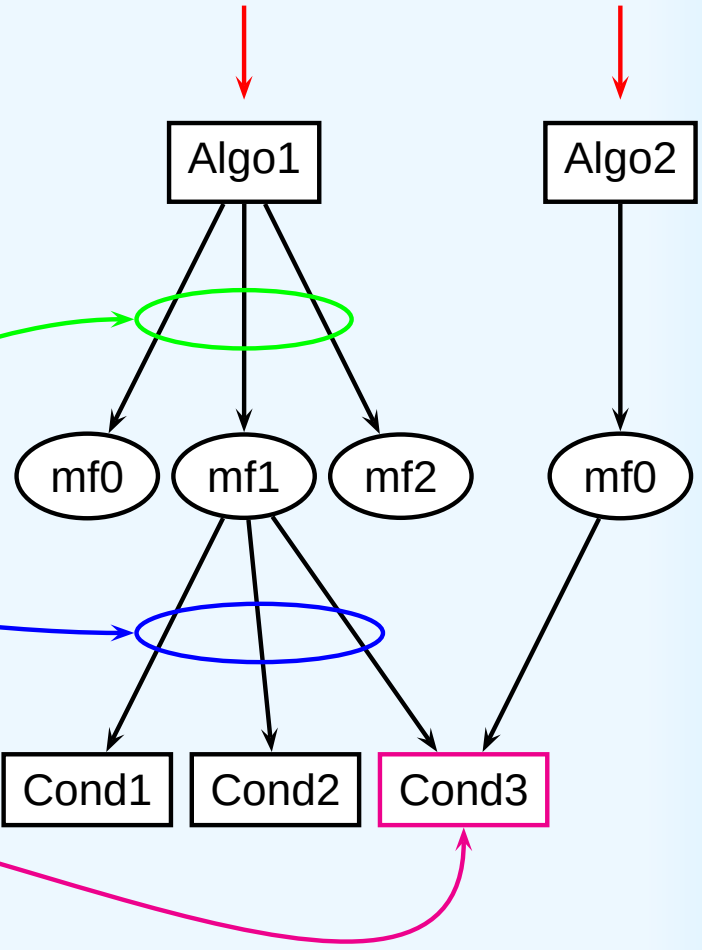
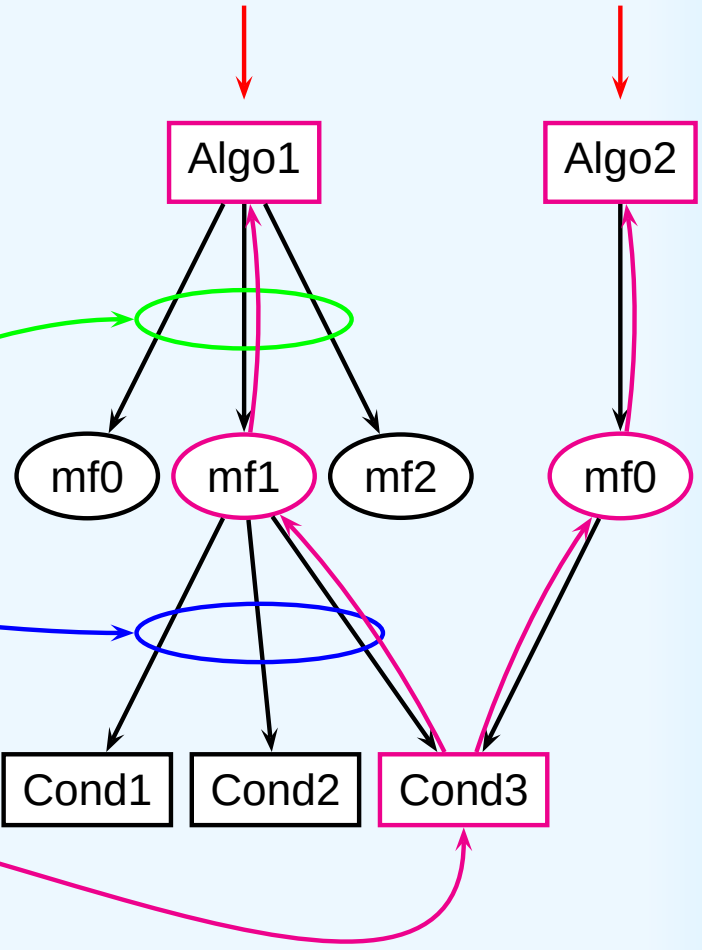
  - object level (methods)
  - method level (child objects)
- invalidate object



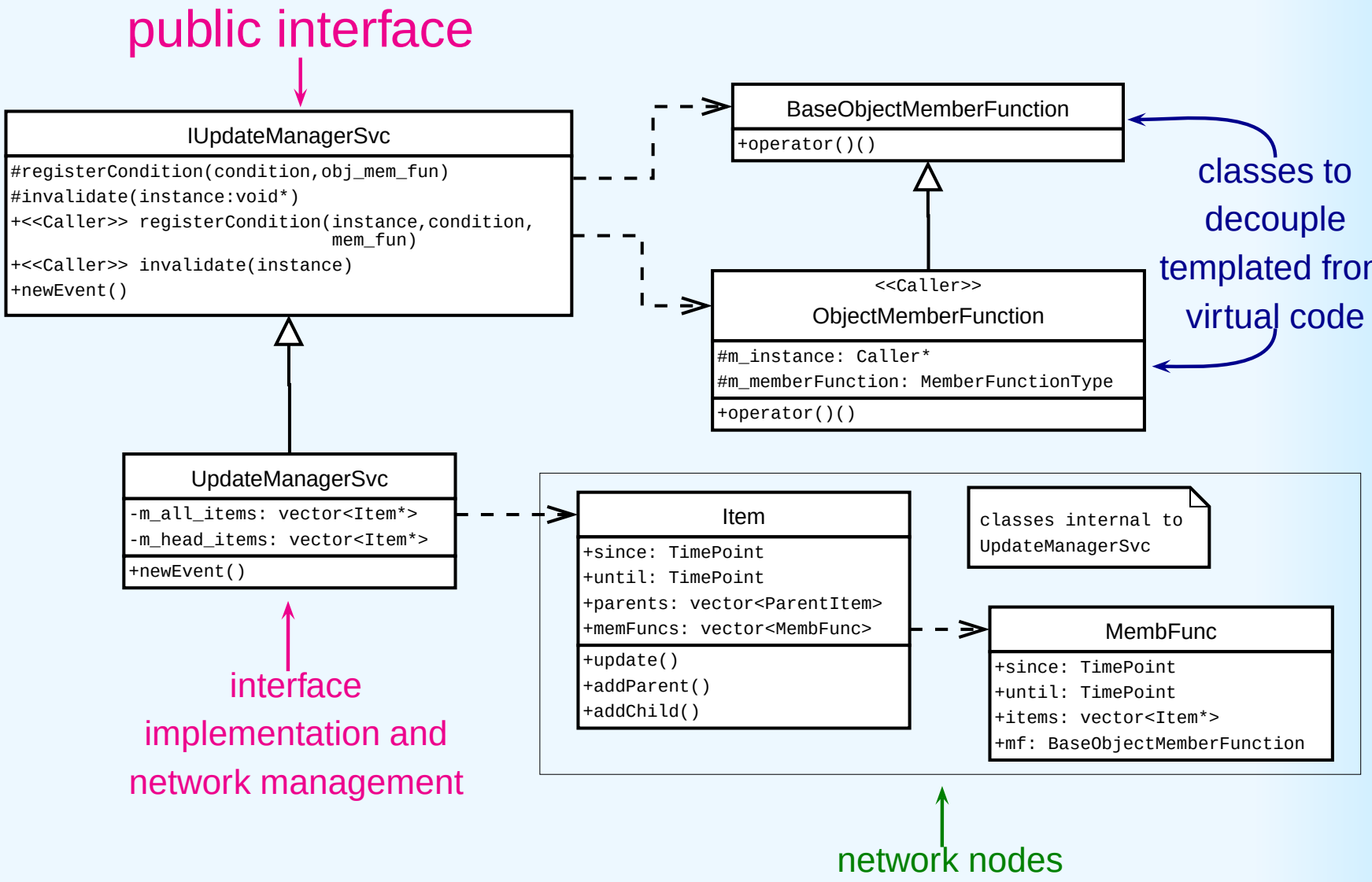
UMSvc: navigation

Given a dependency network:

- start from the head (objects without parents)
- intersection of validities
  - object level (methods)
  - method level (child objects)
- invalidate object
  - propagate to parents



UMSvc: layout (simplified)



UMSvc: usage basics

- objects that need update notifications should register during initialize
  - if the call of memb. func. is not needed, you can use a NULL pointer
- IUpdateManagerSvc::newEvent() must be called before each event
  (as soon as the event time is known)
- UpdateManagerSvc does the rest! 

UMSvc: user guide

- options
  - you need DetDesc
- user c++ file

```
#include "DetDesc/IUpdateManagerSvc.h"
StatusCode MyAlg::initialize(){
  // ...
  IUpdateManagerSvc *ums;
  StatusCode sc =
    serviceLocator()->service("UpdateManagerSvc",
                              ums, true);
  ums->registerCondition(this,"/dd/cond/path",
                         &MyAlg::i_method1);
  ums->update(this);
  ums->release();
  // ...
}
```

get the service pointer

register for a condition

trigger an update for objects created while processing an event

release the service

DetCondExample

DetCondExample

- Example package on DetCond and UpdateManagerSvc
  - CondDB test:
    - fillCondDB.opts
    - testCondDB.opts
    - testMultiDB.opts
  - UpdateManagerSvc test:
    - testUpdateMgr.opts
  - + few extra checks

useful as reference code

Conclusions

Summary

- DetCond operational!
  - simple and flexible
  - depend on DetDataSvc for the event time
    allow other possibilities?
- UpdateManagerSvc ready!
  - flexible and easy to use
  - independent of the CondDB
  - may need code clean up
- for testing
  - How-To on the LHCb WiKi
- More informations on the web
  - LHCb Home → Computing → Detector Conditions

Plans for next future

- maintenance
  - keep in touch with COOL new features
  - large scale testing
- further developement
  - off-line
    - coexistence of 2 set-ups
      simultaneous analysis & trigger simulation
  - on-line
    - integrate DetCond and “on-line”
    - implement condition pushing