Deutscher Wetterdienst
Wetter und Klima aus einer Hand

GRIB data handling with SKY at Deutscher Wetterdienst

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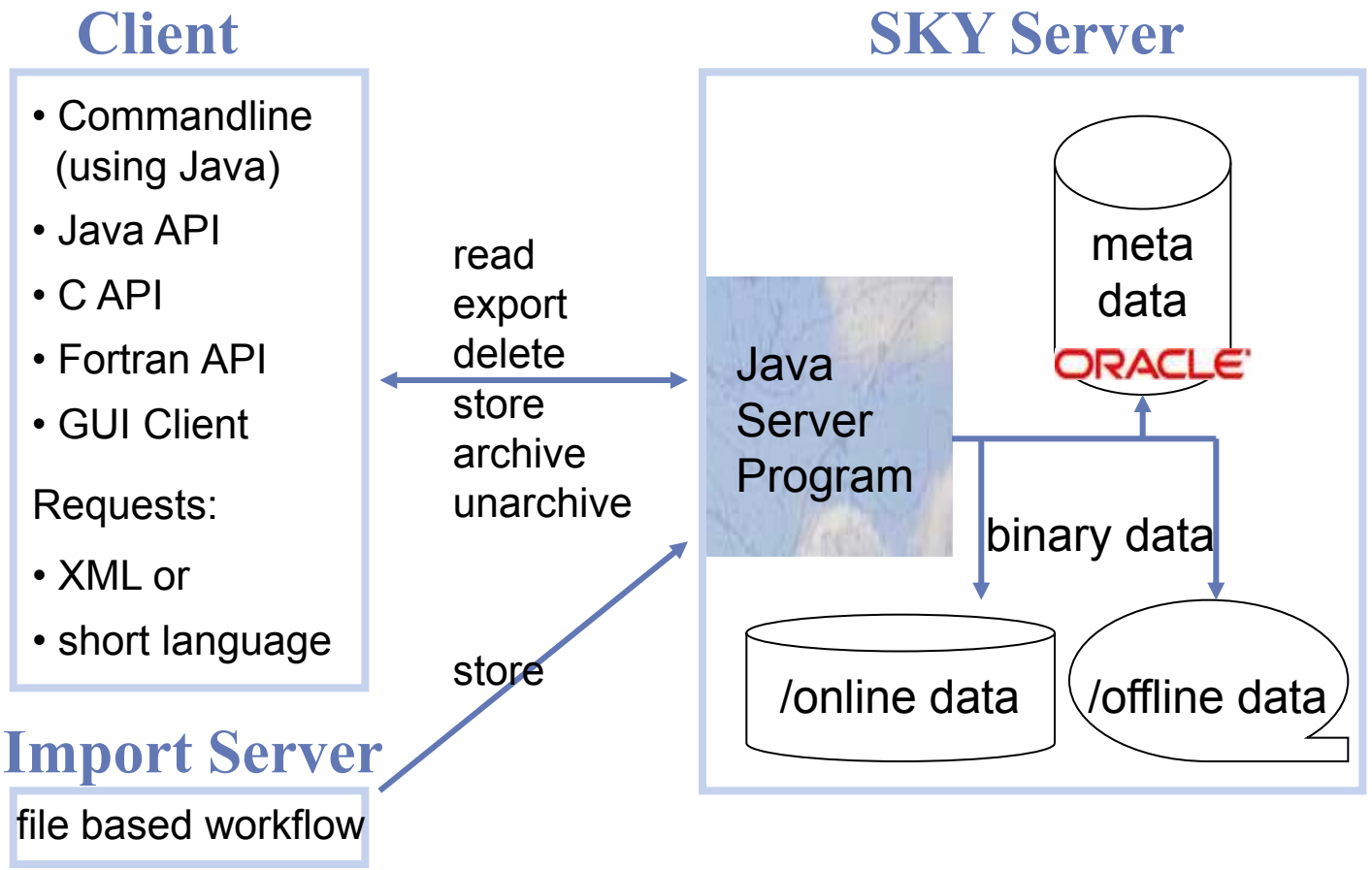
Business Area Technical Infrastructure and Operations, 2.11.2011

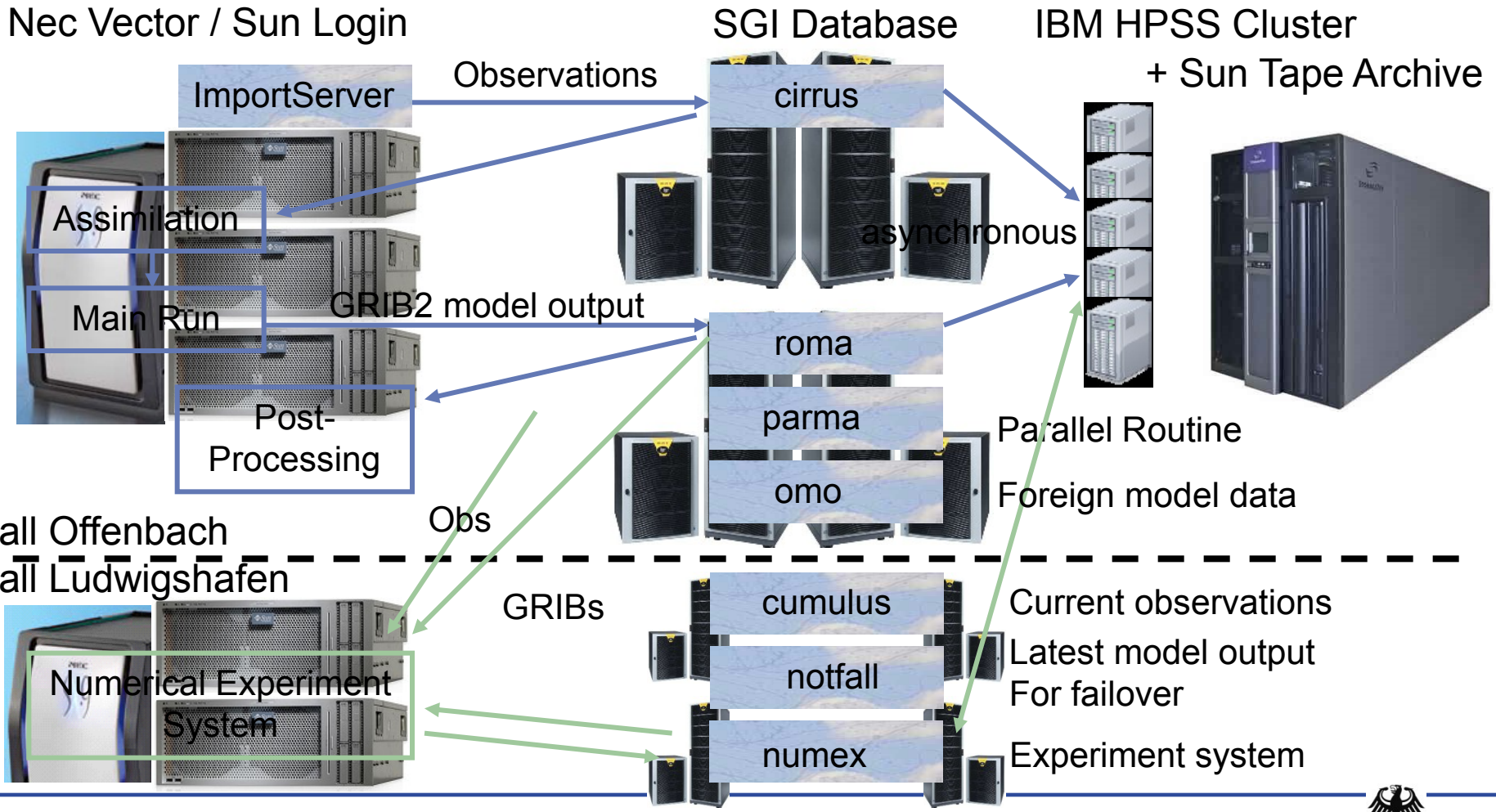
GRIB data handling with SKY at Deutscher Wetterdienst

- **SKY system components**
- **NWP data flow using SKY (Summer 2012)**
- Data migration CSOBANK -> SKY
- Migration GRIB1 to GRIB2
- Hierarchical storage management (HSS)
- Update of backup system

SKY system components



NWP data flow using SKY (Summer 2012)



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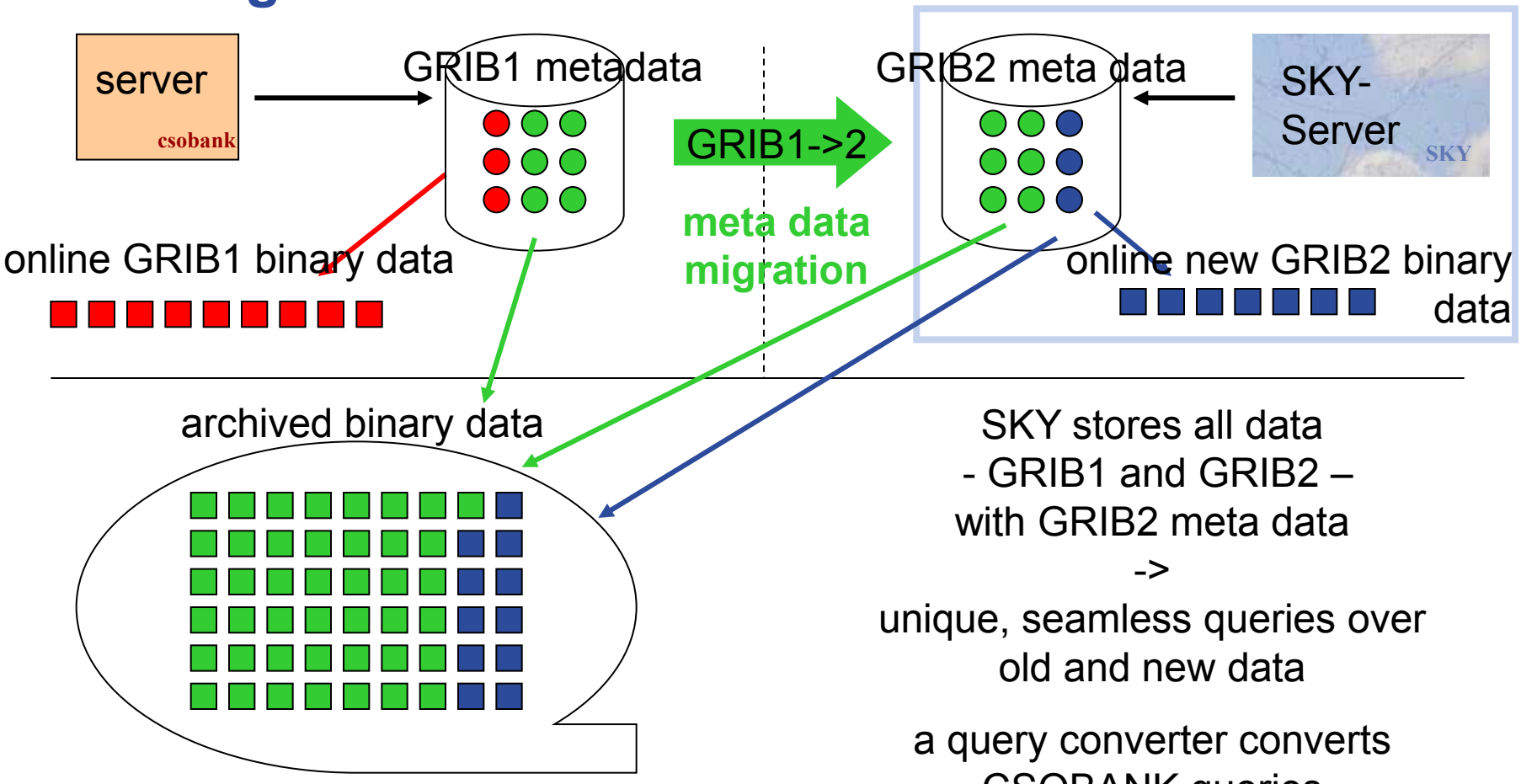
Data migration CSOBANK -> SKY



SKY stores all data
- GRIB1 and GRIB2 –
with GRIB2 meta data
->
unique, seamless queries over old and new data

a query converter converts CSOBANK queries

Migration GRIB1 to GRIB2

- Deutscher Wetterdienst migrates its forecasting and postprocessing routines to ECMWF grib_api to ease migration
- As SKY is implemented in JAVA, grib_api is not used directly
- SKY uses grib_api configuration files
  - for migration
  - for parameter selection: element short names can be used
- additionally complex GRIB1 to GRIB2 conversion rules are implemented

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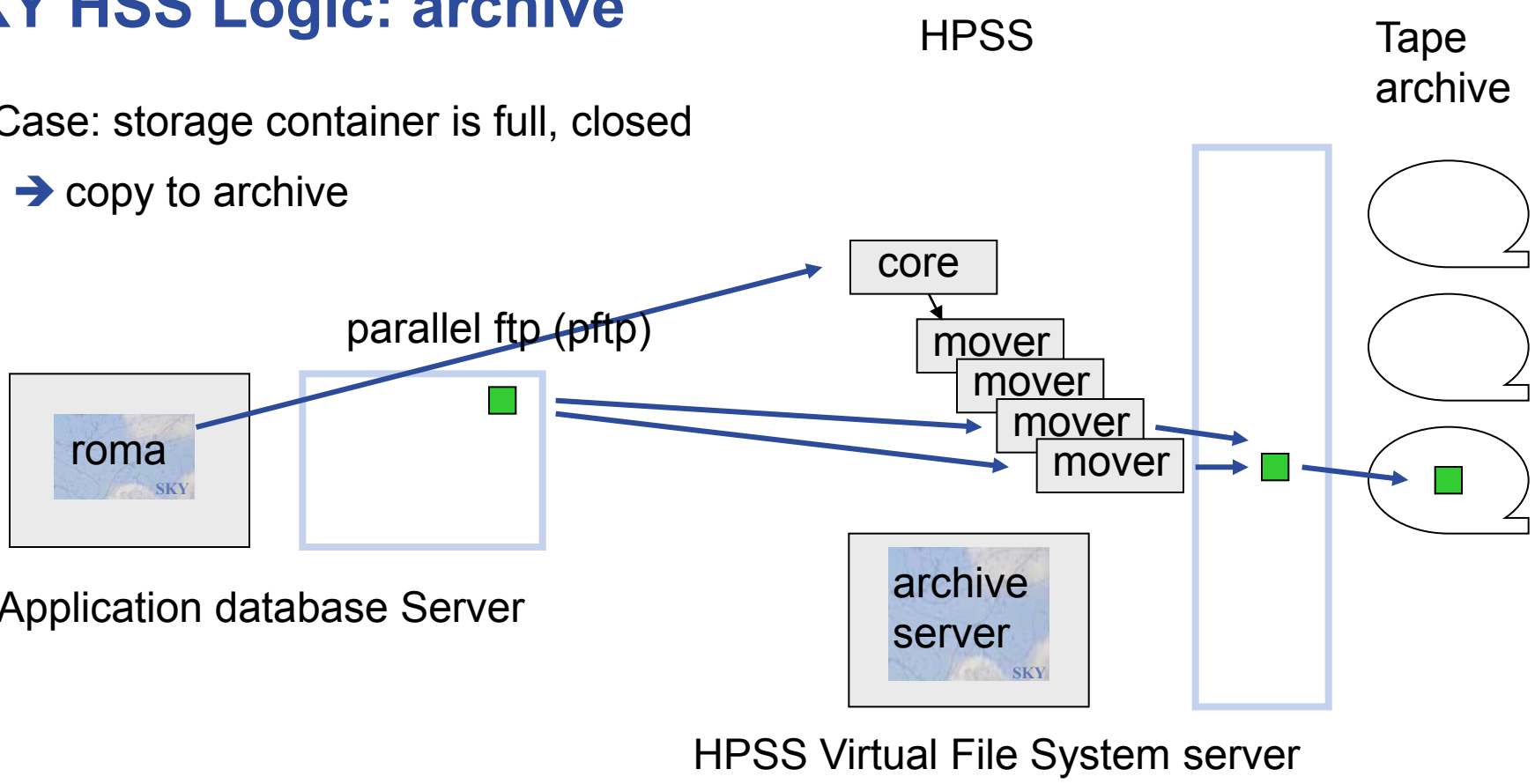
Hierarchical storage management (HSS)

- Standard methods of hierarchical storage management are not used so far at Deutscher Wetterdienst, because
  - the total amount of today db server online storage is 760 TB
  - no HPC vendor offered this functionality during invitation to tender so far
  - decision against combination of db and archive server

- SKY HSM functionality had to be developed to bridge between
  - Database servers with SKY server and online storages
  - Archive server front end to Tape robot archive system with a real HSM of 480 TB
    - HPSS with 4 mover and 3 virtual file system server

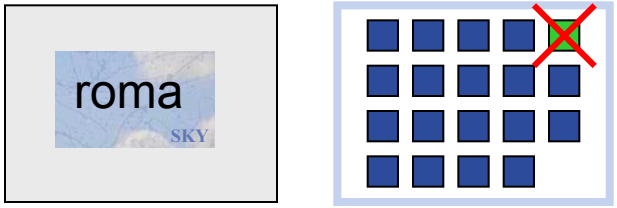
SKY HSS Logic: archive

- Case: storage container is full, closed
  - copy to archive

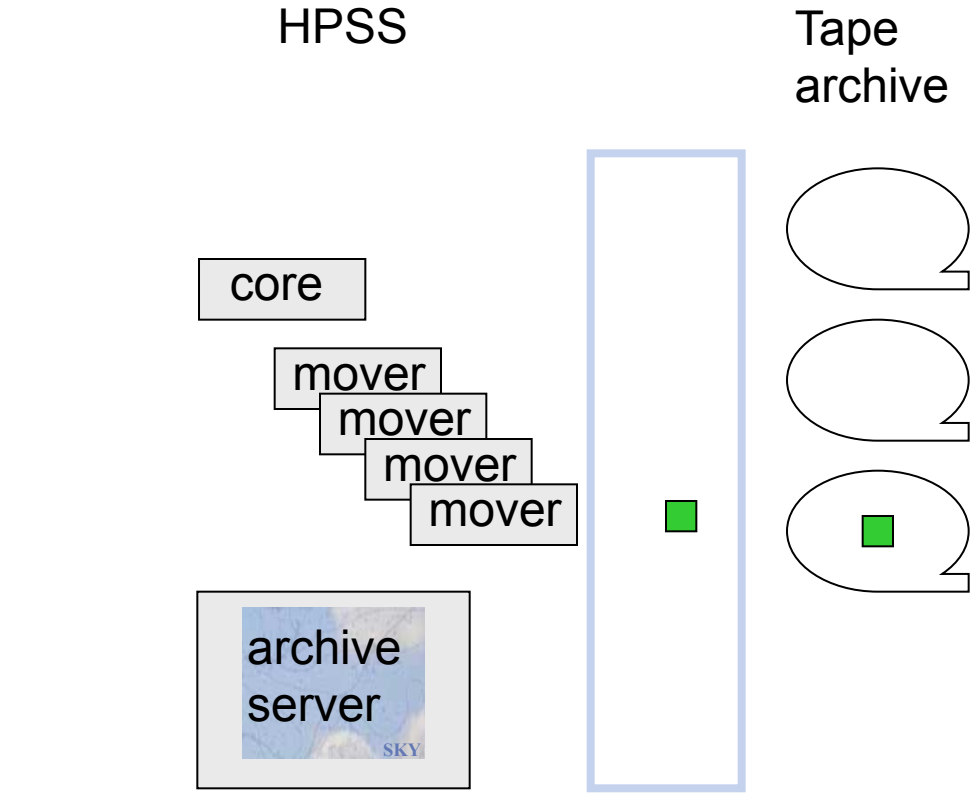


SKY HSS Logic: delete

- Case: file system is almost full
  - delete already archived and less used storage container (weight based approach)



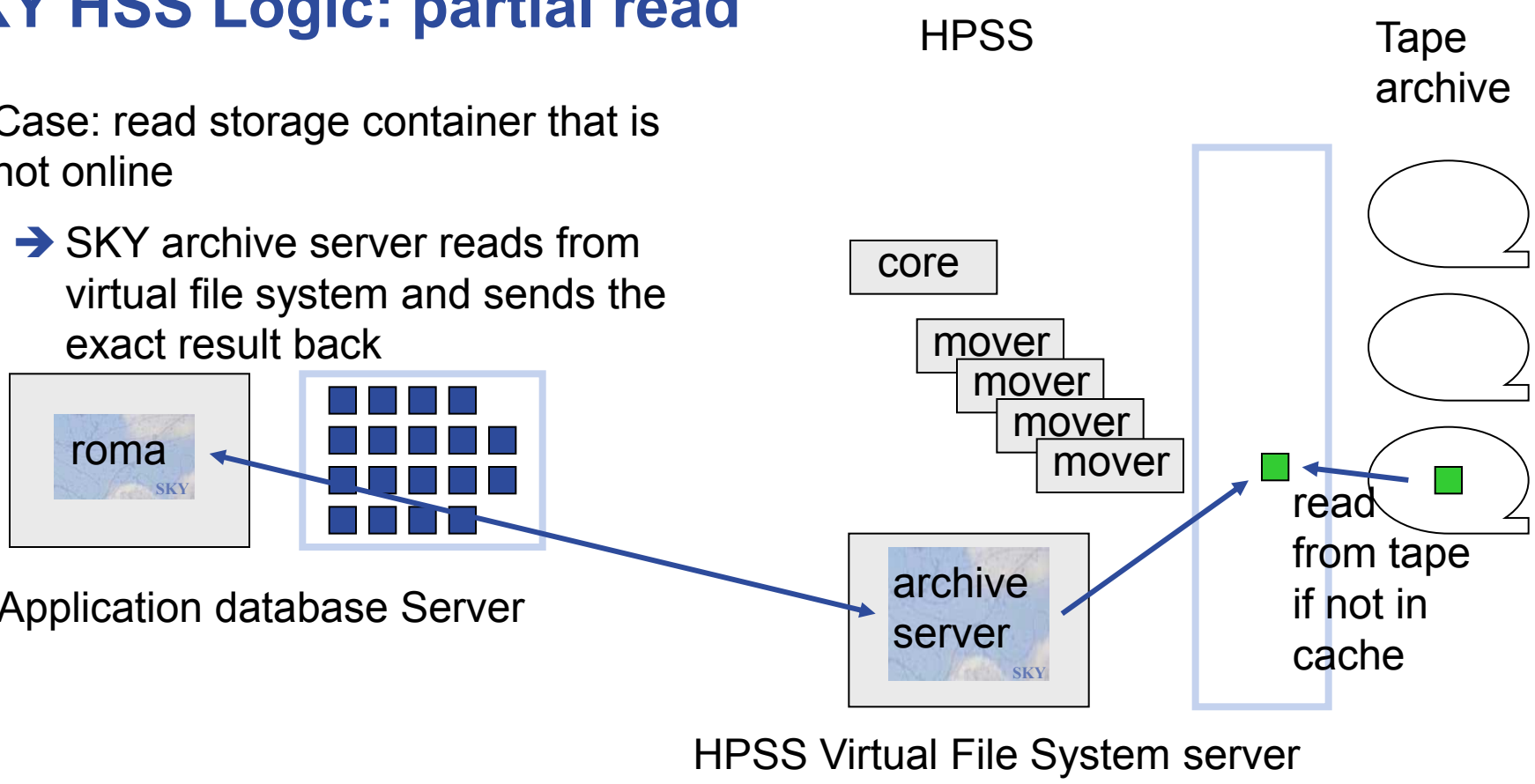
Application database Server



HPSS Virtual File System server

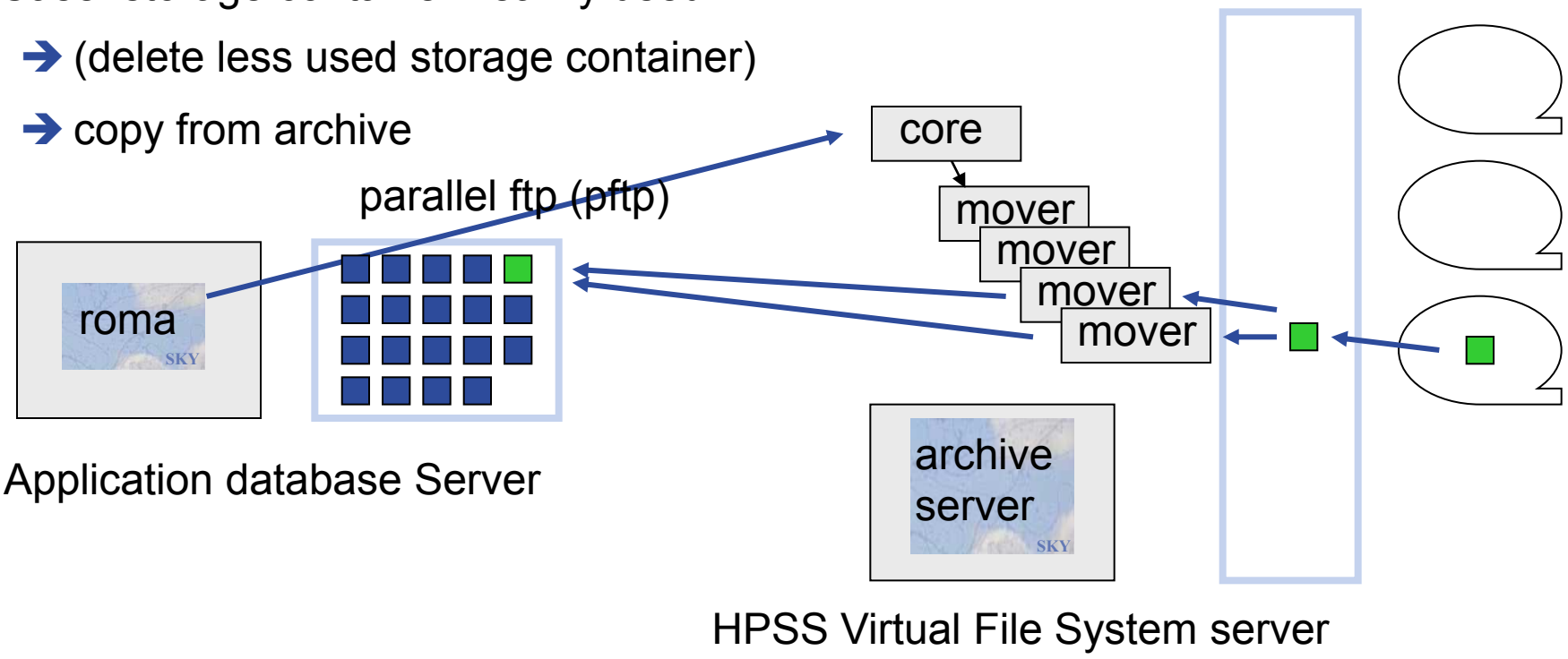
SKY HSS Logic: partial read

- Case: read storage container that is not online
  - SKY archive server reads from virtual file system and sends the exact result back



SKY HSS Logic: unarchive

- Case: storage container heavily used
  - (delete less used storage container)
  - copy from archive



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Update of backup system

- backup system has to be updated constantly to minimize switch over time and keep up to the tight model schedule
- if a storage container (4 GB) is full or if the data set (ensemble member, forecast step) is closed:
  - copy meta data and binary data of those storage containers to the backup systems
- if the backup system is the primary system, the backup system feeds the main system

Questions

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