

Data Handling

Ideas for the Emulsion DAQ System
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Ideas for the Emulsion DAQ System: **Presentation Plan**

Data Hierarchy

Activities & Needs

Brick Management

Task Sharing

DataBase Infrastructure

Conclusions

Ideas for the Emulsion DAQ System

Data Hierarchy

Ideas for the Emulsion DAQ System: Data Hierarchy

Experiment World
Data storage: ROOT
Collaboration Data

Mini DataRepository
(event reconstructions +
their base tracks)

Reconstruction SW

Maxi DataRepository
(all base tracks)

Local (European) DB
(all base tracks + data needed for location / selection / analysis)

Emulsion DAQ World
Data storage: DB
“European” data formats

Local DB

File Storage

Monitor

Dispatcher

This presentation will dwell on this “world”

Ideas for the Emulsion DAQ System

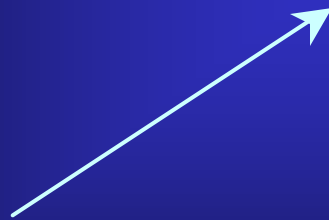
Activities and Needs

Ideas for the Emulsion DAQ System: **Activities & Needs**

Activities



≈ 10 days overall...



CS scanning

(New brick request)

Vertex location

Vertex selection

Precision measurement

Manual measurement

Brick transport to / from laboratories

Intermediate event reconstructions

Final event reconstruction

Automatic data analysis

Ideas for the Emulsion DAQ System: **Activities & Needs**

Needs

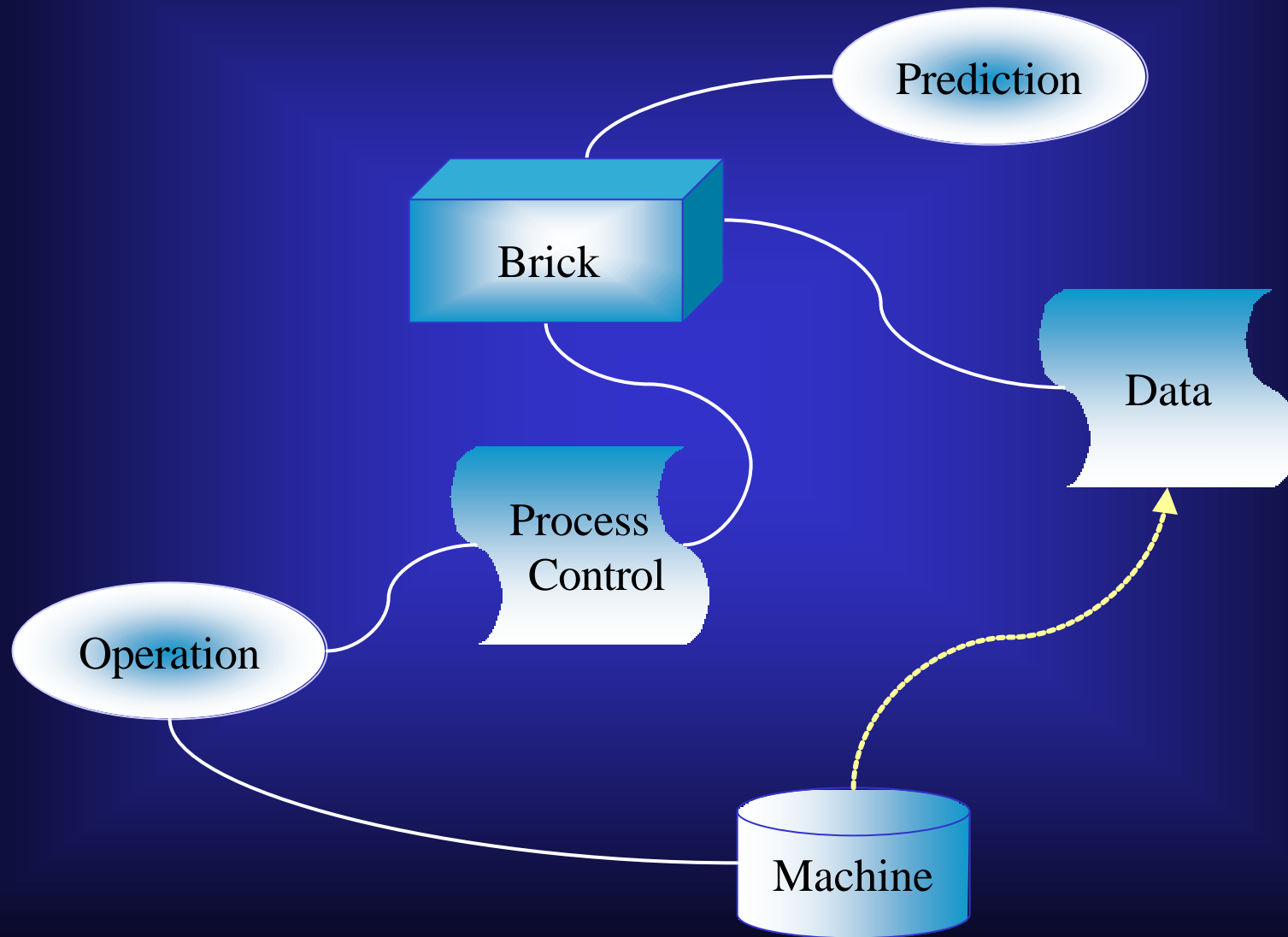


- Satisfy quasi-on-line scanning requirements
- Fully document every step
- Track brick processing and physical location
- Automatic recovery (and / or easy manual recovery) from failures:
 - power interruption
 - network downtime
 - data storage support failures
 - brick damage or loss during transport
 - plate damage or loss during handling
 - software bugs
- World-wide availability of data
- Remote administration / support

Ideas for the Emulsion DAQ System

Brick Management

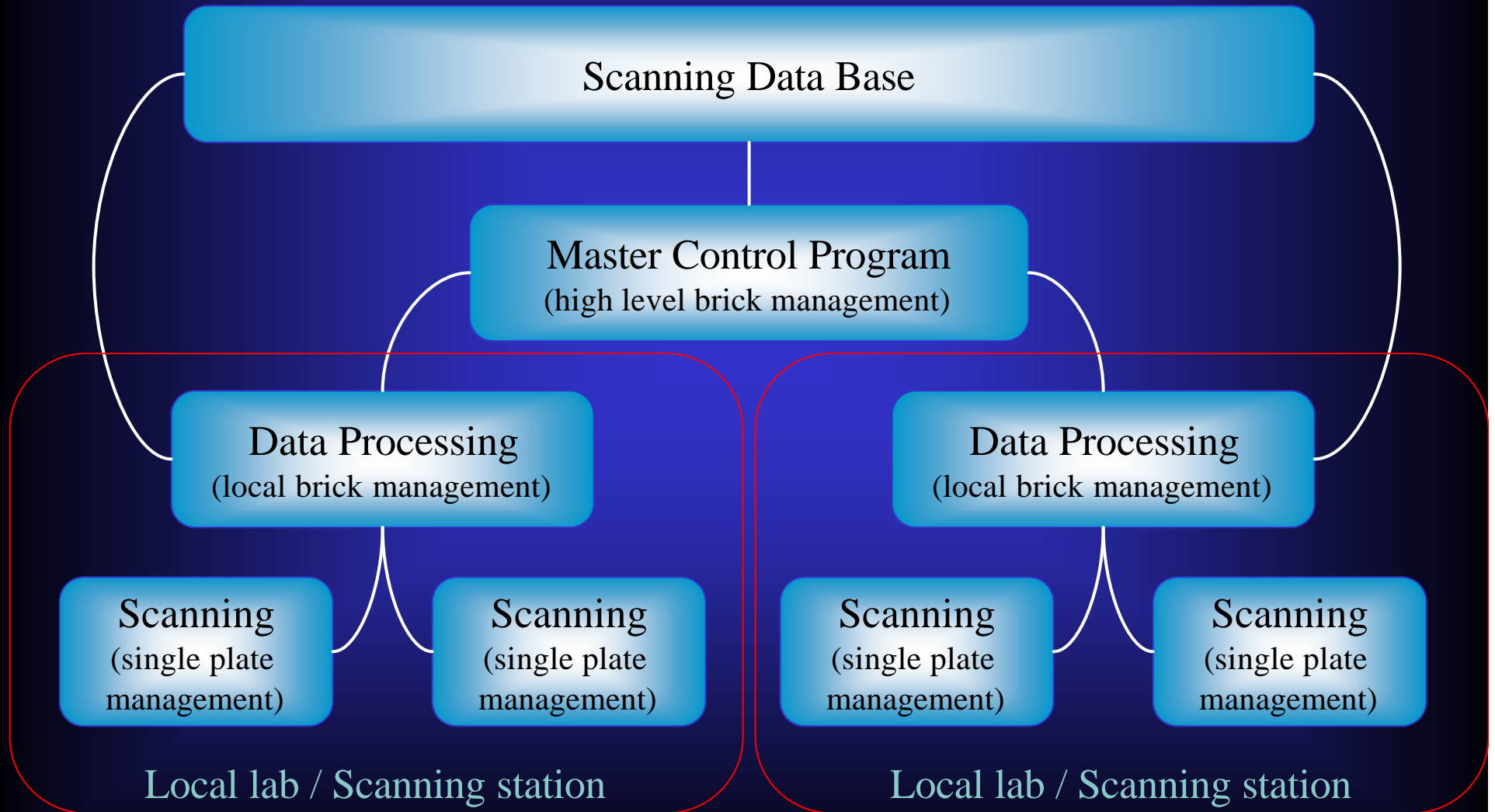
Ideas for the Emulsion DAQ System: **Brick Management**



Ideas for the Emulsion DAQ System

Task Sharing

Ideas for the Emulsion DAQ System: Task Sharing



Ideas for the Emulsion DAQ System: Task Sharing

- When a new brick enters the Emulsion DAQ System, the Master Control Program creates a new process for that brick.
- For each operation (CS scanning, transport, location, etc...) to be performed on a brick, the MCP decides when and where, according to each scanning facility's capabilities.
- At the end of each operation, the processing machine suggests the next step (e.g. more detailed measurement in the same scanning facility). The MCP can accept / reject the suggestion.
- Each operation is logged (start / finish, details) in the DB. It is possible to recover from interruption at any step. The system managers can decide to help / override the MCP decisions if needed. The MCP periodically reviews the pending operations and performs recovery tasks if needed.
- In case of interrupted communication with the MCP, the scanning facilities can keep working. When the communication is restored, the MCP can accept / reject the work done in the meanwhile.

Ideas for the Emulsion DAQ System

DataBase Infrastructure

Ideas for the Emulsion DAQ System: **DataBase Infrastructure**

Requirements



Data Safety

Logical Integrity

Data Security

Availability

(
resistance to failures:

- power interruption
- network downtime
- data storage support failures

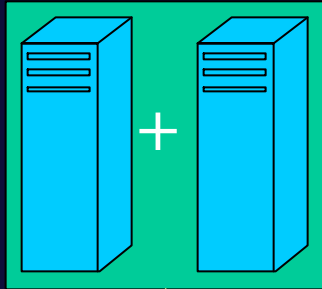
)

Access Speed

Ease of use

Remote administration

Ideas for the Emulsion DAQ System: **DataBase Infrastructure**



Centralized DB with replicas

Machines stop working if connection with central is down
The network may act as a bottleneck

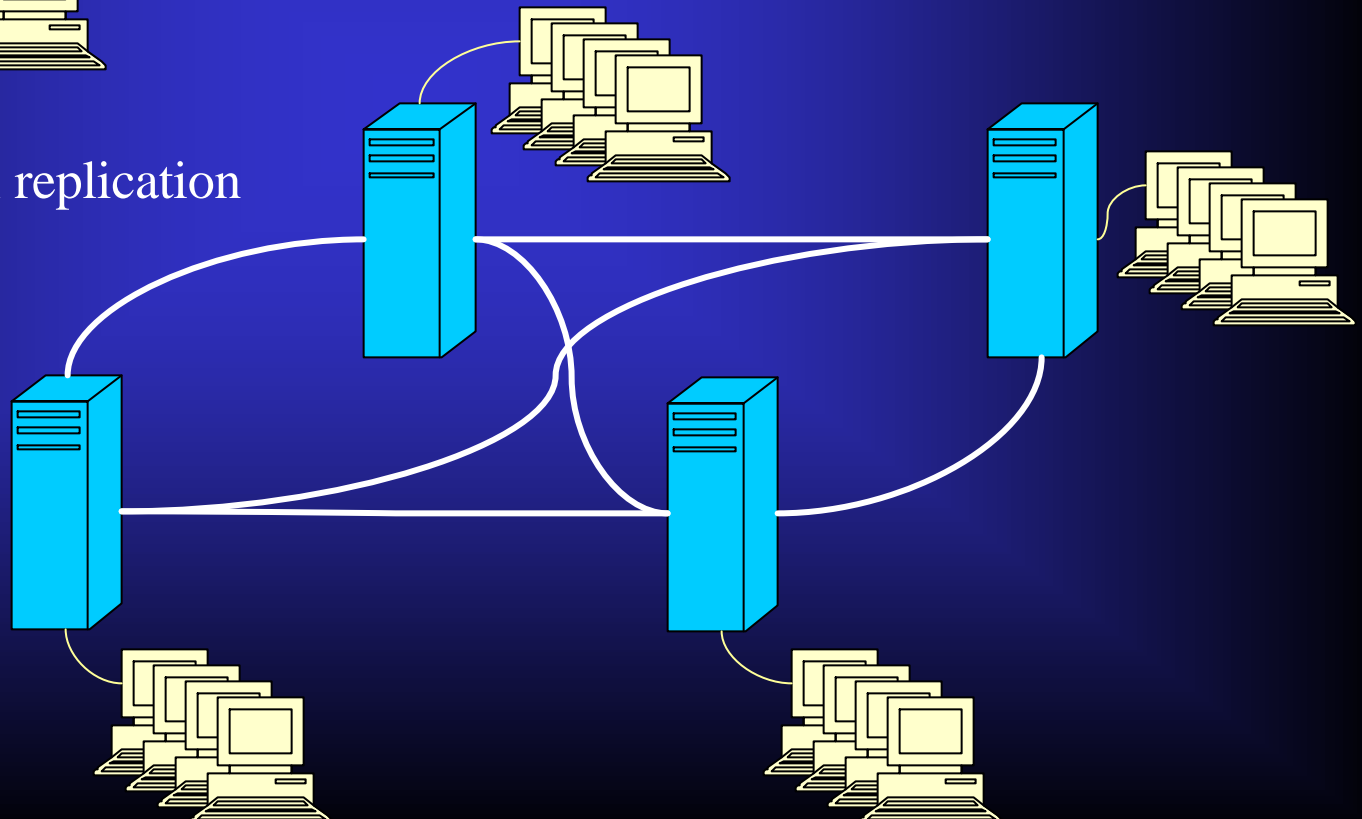


Distributed DB (through replication / data sharing)

Quick access

Automatic sync

If local DB fails,
remote replicas
are automatically
used



Ideas for the Emulsion DAQ System

Conclusions

Ideas for the Emulsion DAQ System: **Conclusions**

- A scheme for the overall organization of the European Emulsion DAQ has been presented
- The solution envisaged provides performance and robustness
- It must be possible to maintain the system and keep it running in best efficiency with very small administrative / programming effort
- Open discussion and suggestions both on the scheme (now!) and on the details (maybe in the next future when the scheme is stable..) are very valuable!!!
- Contributions are welcome!!!!