1. MOTIVATION

- Operations at observing sites should have quick and reliable access to the data, therefore observing sites are provided with their own local database server.
- Synchronization of the database servers is done through replication.
- After several years of operation, databases at the observing sites has grown considerably. There was no standard procedure for removing data kept only for archiving purposes.

Standard procedures build into the ESO repositories for archiving data no longer necessary for operations.

2. MOVING TO A SCALABLE ARCHITECTURE

- OBs are executed in two modes:
  - Service mode: OBs controlled from headquarters and replicated to Observing sites for execution.
  - Visitor mode: OBs directly executed in the mountain.
- Two main issues:
  - Visitor mode OBs only at the observing sites.
  - No distinction between current operational OBs and historical OBs.

3. SERVICE MODE OPERATIONS

- Standard service mode operations:
  - OBs produced by investigator are submitted to Garching.
  - OBs are reviewed, accepted and scheduled from Garching.
  - OBs are replicated to the observing sites and executed by ESO staff.

4. VISITOR MODE OPERATIONS

- Standard visitor mode operations:
  - OBs produced by investigators are directly executed in the observing sites.
  - OBs are stored in the local repository for archiving purposes.
  - OBs are replicated to the headquarters.

5. OB RECOVERY STRATEGY

- It is possible that already archived OBs will have to be executed again by means of the OB recovery strategy.
- OBs moved to the operational database at Garching are replicated to the operational database at the observing sites by the same mechanism used for standard service mode OBs.

6. CONTENT MANAGEMENT

- Data consistency check is performed following two rules:
  - All data in the operational repository at Garching must be returned from the SM views at the observing sites.
  - All data returned by the VM views at the observatory must exist in the historical repository at Garching.

7. CONCLUSIONS

- Operational databases contain only data that might be necessary for operations at the observing sites.
- Operational databases are kept in a more or less constant size.
- Archived data are only kept in the headquarters.
- Database content management is easy to perform in small databases.

REFERENCES


LEGEND

- A stored procedure is a set of Structured Query Language (SQL) statements with an assigned name. It is stored in the database and the major benefit of this technology is the substantial performance gains from precompiled execution.
- A database view is a virtual table composed of the result of a query. The main advantage used for ESO architecture is the possibility of subsequent data contained in a table.
- Database replication is the process of sharing information between databases. In ESO architecture is done in two ways: replicating data-sharing operations, replicating stored procedure invocations.

The new architecture solves the issues by means of:
- Replication of Visitor Mode OBs from the observing sites to the headquarters.
- Creation of a historical repository at the headquarters to hold all the OBs for archiving.