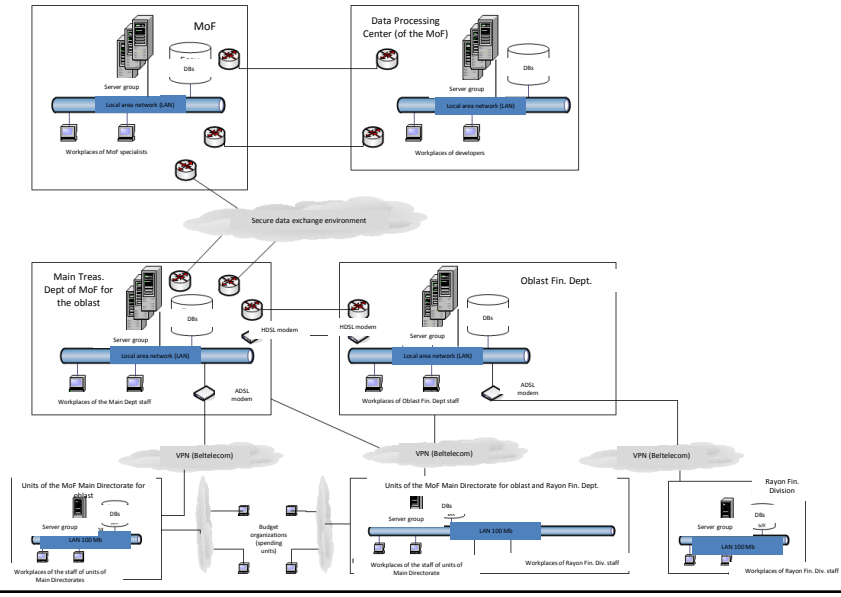
Development of the Information Analysis System of the Ministry of Finance of Belarus

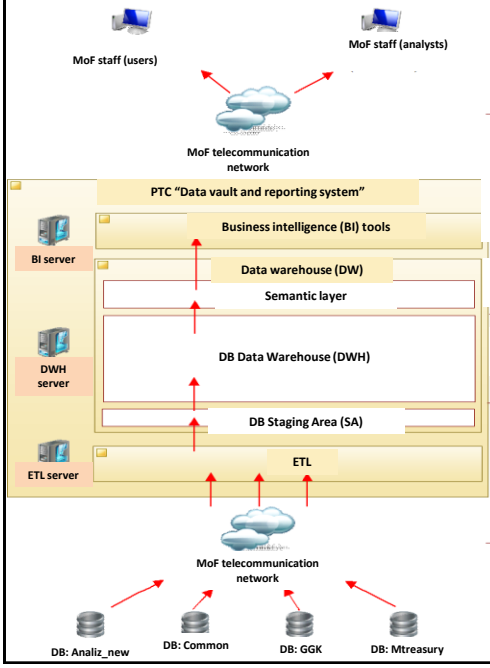
ASFR organizational and technical structure



Main Objectives of Creating the PTC (program-technical complex)

- to create a data warehouse (DW) providing **fast access to the information** generated at **different tiers** of budget execution; the DW shall provide reliable data;
- to **generate reports** based on the detailed and summarized data;
- to reduce the time to generate **customized reports** by eliminating the programming phase in the report generating process;
- to reduce labor intensity and the time to generate **non-customized reports** by replacing the programming phase by generating reports in the visual design environment;
- to provide a **consistent** and **intuitive interface for report generation**.

Solution structure



User layer

Users get predesigned reports. Analysts can get customized reports applying the above business terms.

PTC layer

Business intelligence (BI) tools enable users to work with business terms that are understandable to the users when hiding the backend of the data warehouse model. Generating predesigned reports.

Based on the data, the information of the semantic layer is generated in the data warehouse database.

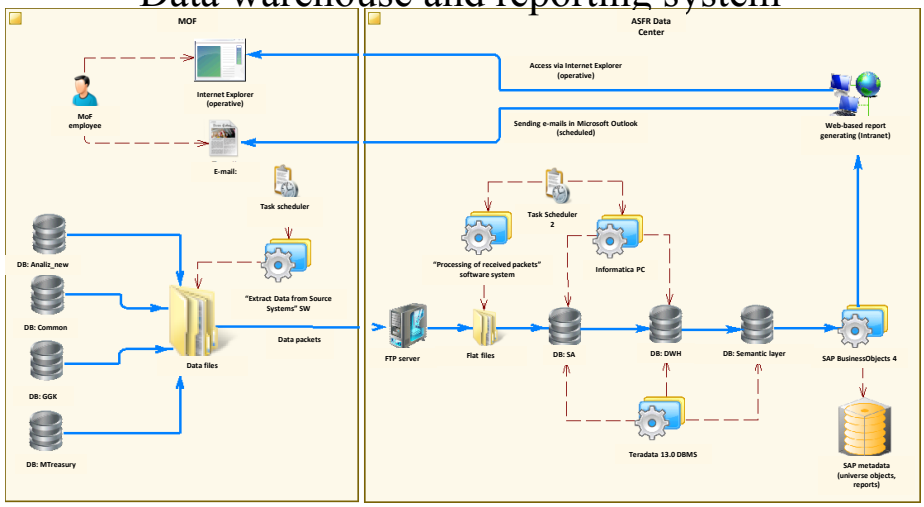
Cleaned data is uploaded from the staging area directly to the data warehouse database.

The received data is uploaded to the staging area according to the schedule based on the developed loading scenarios. Data cleaning, aggregating, normalizing.

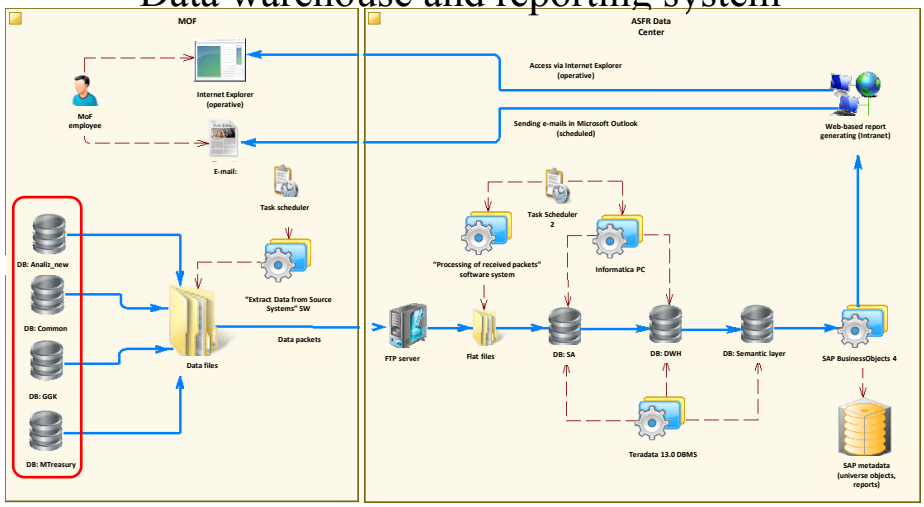
Source systems layer

After the staff of the unit finishes work, the source systems upload data based on the schedule.

Implementation of the PTC solution "Data warehouse and reporting system"



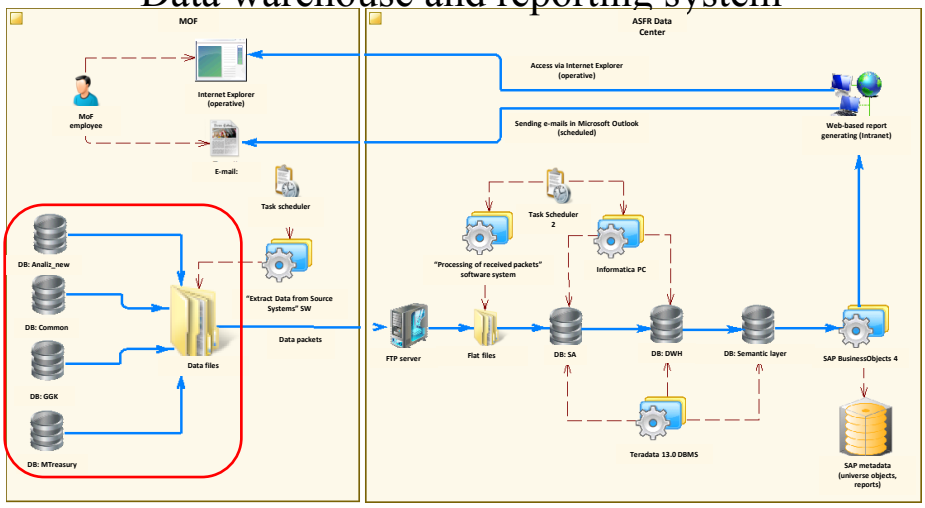
Implementation of the PTC solution "Data warehouse and reporting system"



4 databases as data source

Common - reference data
Mtreasury – Expenditure execution of the republican budget
GGK – Revenue execution of the republican budget; reference data
Analiz_new - reference data

Implementation of the PTC solution "Data warehouse and reporting system"

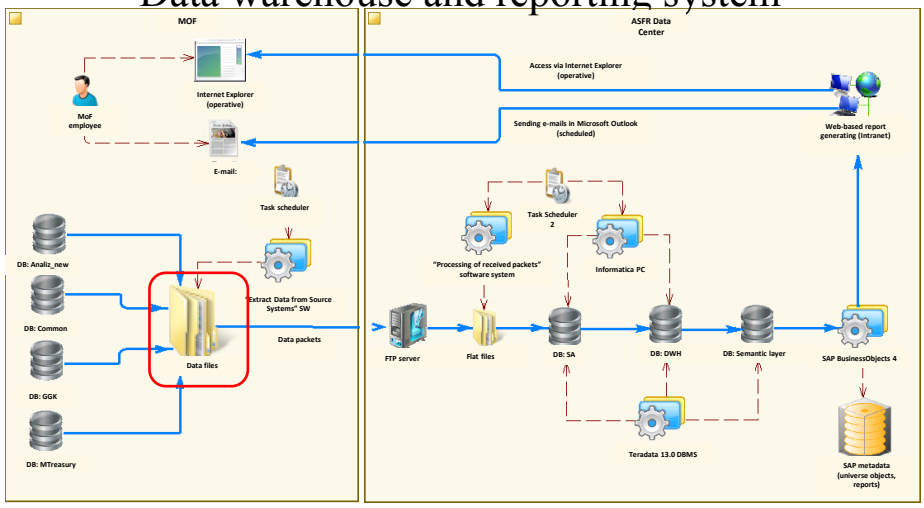


1. Downloading information from the database

"Extract Data from Source Systems" software

116 scripts for data download

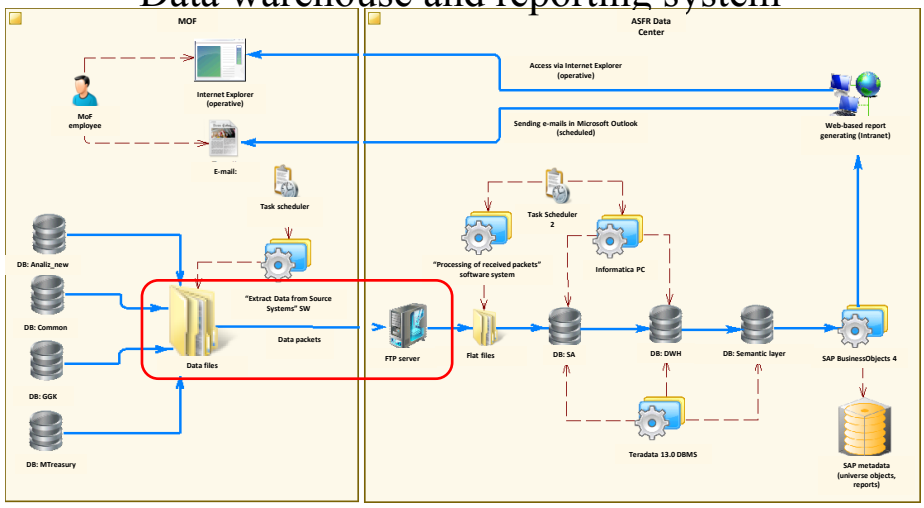
Implementation of the PTC solution "Data warehouse and reporting system"



2. Increments formation

"Extract Data from Source Systems" software

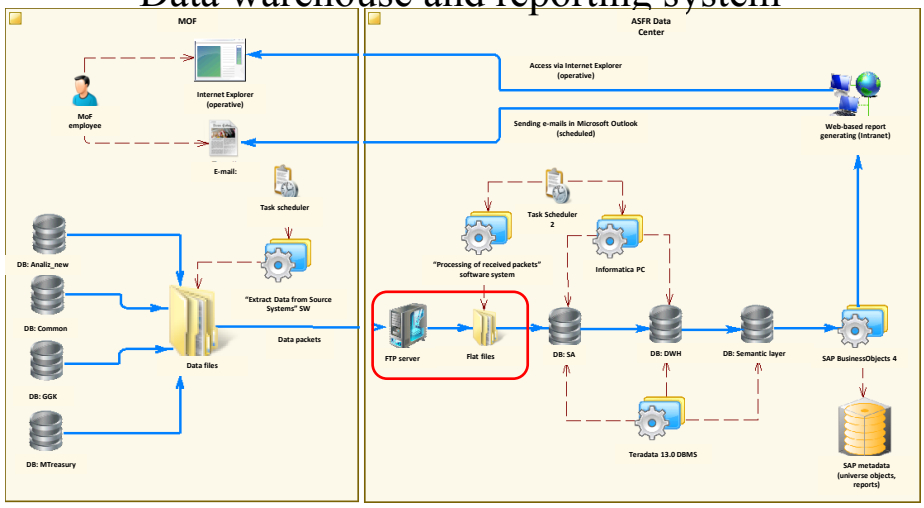
Implementation of the PTC solution "Data warehouse and reporting system"



3. Generating data packages and loading them to the FTP server

"Extract Data from Source Systems" software

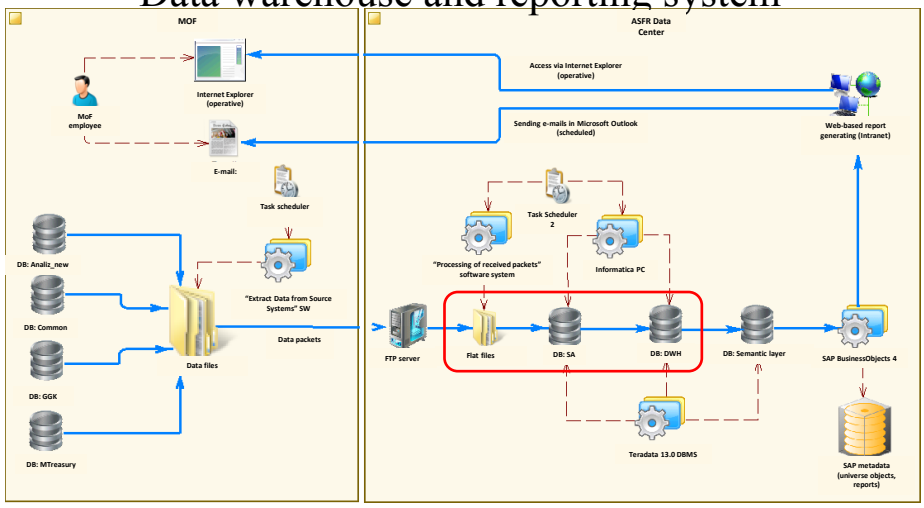
Implementation of the PTC solution "Data warehouse and reporting system"



4. Preparing packages for loading

"Processing Received Packets" software

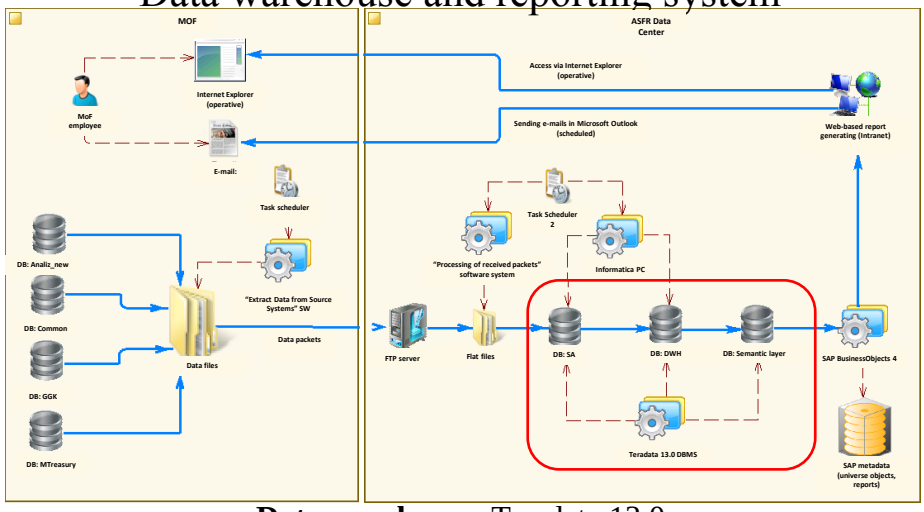
Implementation of the PTC solution "Data warehouse and reporting system"



5. Uploading data to the data warehouse

Informatica PowerCenter (116 scenarios for data uploading into SA with subsequent uploading to DW (including 1946 SQL-scripts)

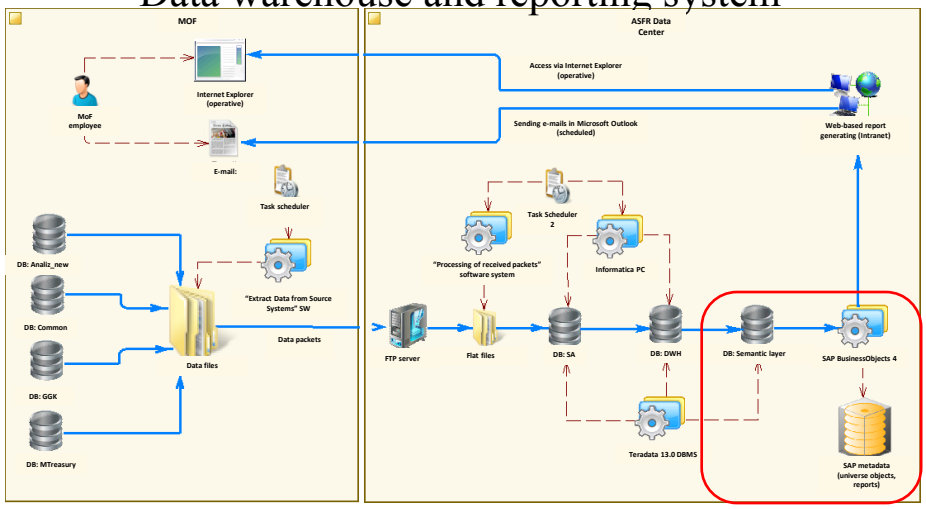
Implementation of the PTC solution "Data warehouse and reporting system"



Data warehouse: Teradata 13.0

- 314 tables
- 272 links between tables
- 302 dampers in the semantic layer
- tables with 90 Gb of data
- tables with 929 165 095 rows

Implementation of the PTC solution "Data warehouse and reporting system"

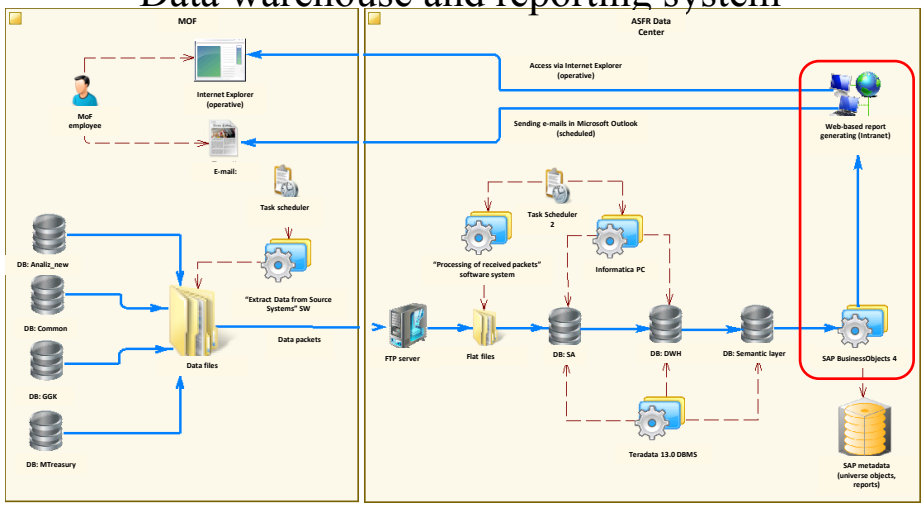


6. Report generation

SAP BusinessObjects 4

241 representations for generating the Summary Report

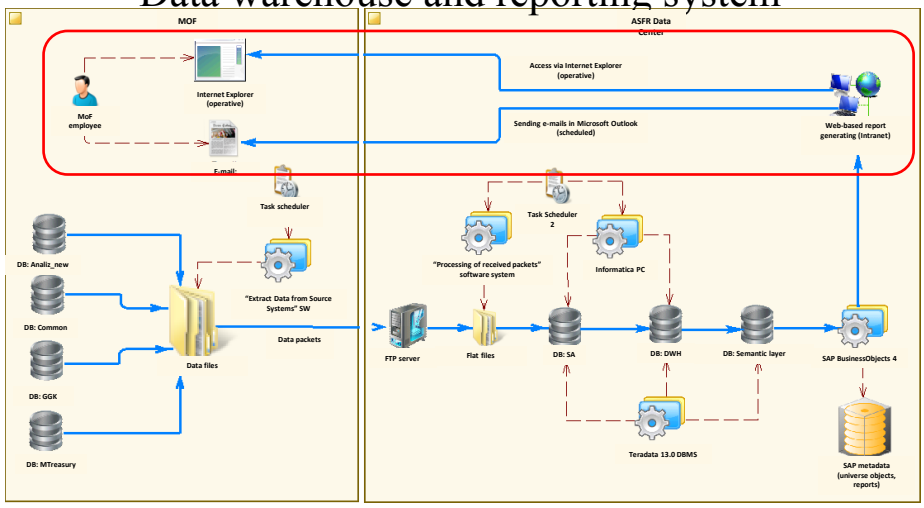
Implementation of the PTC solution "Data warehouse and reporting system"



7. Generating statutory reports

SAP BusinessObjects 4

Implementation of the PTC solution "Data warehouse and reporting system"



8. Forwarding reports to users

Implementation Technology

1. Based on the actual report we decide what we extract and from where
2. Software development for data extraction
3. Development of DW structure
4. Uploading data to DW (cleaning, aggregating)
5. Universe creation
6. Report generating

System Software in Use

- DBMS: Teradata v.13.0
- ETL — Informatica PowerCenter
- BI - SAP BusinessObjects 4

Justification of Choice

- Reference: “The best in class”
- Scalability
- Popularity
- Support

Selection of the Data Warehouse. Technical Criteria.

Criterion	Requirements	Teradata	Oracle Exadata	IBM DB2
Large amount of data / Data scalability (Data Scalability)	○	◔	◑	◔
Supporting concurrent request processing (Query Concurrency)	○	◔	◑	◔
Ad hoc queries (Query of Freedom)	◑	●	◑	◔
Data scanning rate (Scan Rate)	●	●	●	◔
Backing-up & restoring features (Backup & Restore)	●	●	●	◔
Data status (Data Freshness)	◑	◔	◔	◑
Usability (Ease of Use)	●	●	◑	◔
Technical support (Customer Service)	●	●	◔	◔

● Excellent (5) ◔ Good (4) ◑ Satisfactory (3) ◔ Bad (2) ○ Too bad (1)

Teradata Advantages

- The database management system (DBMS) has been originally designed as an analytical tool (OLAP)
- Ease of development (if compared to competitors)
- Scalability up to a petabyte (PB)
- Multiple customers in the CIS countries (Russian government agencies, Sberbank (Russia), VTB 24, etc.)
- High level of Russian-language vendor support, including the phase of solutions development

Selection of BI

- We analyzed and tested:
  - Microstrategy
  - Cognos
  - Prognoz
  - SAP BusinessObjects
  - Galaktika-BI

Key Indicators for Comparison

BI function
Preparing object metadata (dimensions and indicators) for reporting
Report debugging
Generating a customized standardized report
Generating a customized non-standardized report
Generating a non-customized standardized report
Generating a non-customized non-standardized report
Data analysis
Real-time data access
Scheduled data access (generation and distribution of reports, data cube generation after data upload)
Working speed
Ease of operation
Availability of documentation

Thank you for your attention