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Scenarios Development and Execution based on BASHYT and gSWATexe

MINISTRY OF EDUCATION AND RESEARCH

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CGIS
Computer Graphics
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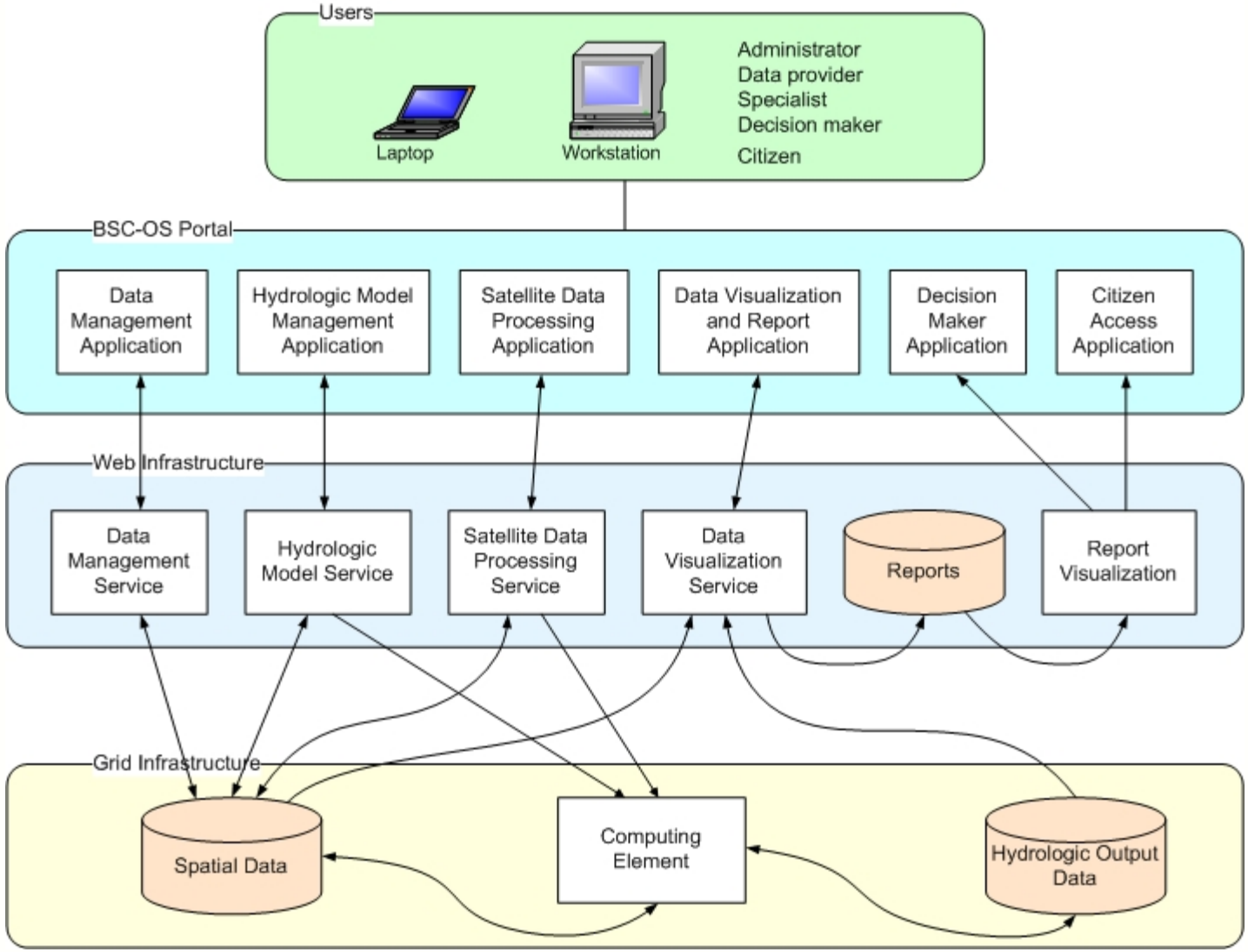
enviroGRIDS Portal Architecture

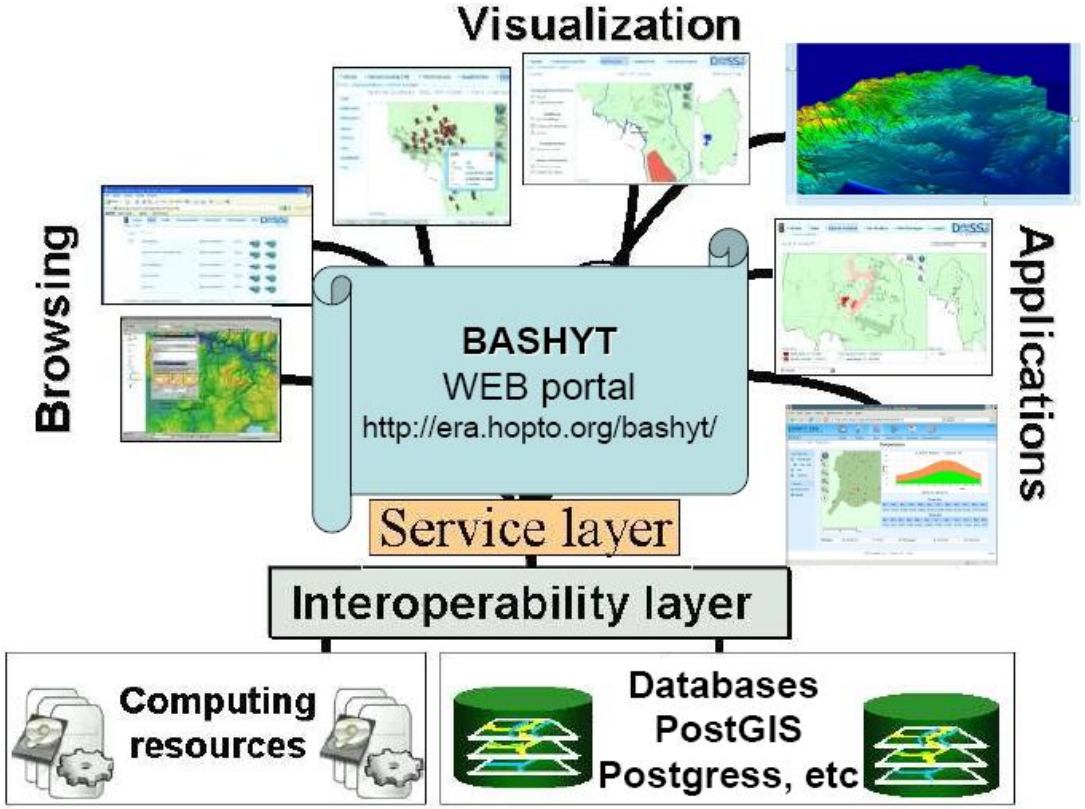


Bashyt – Hydrological Scenarios Editor

- Basin Scale Hydrological Tool Decision Support System (BASHYT DSS)
  - integrated web portal that exposes hydrological application, based on a watershed scale model, to support decision makers
  - the storage, management and querying of data collections, visualization of data through the web GIS
  - the portal can create reports (graphs, maps, etc) through automatic standardized procedures
  - offers a live programming environment and web template features, making the programming and application development available to beginner developers
  - is able to use output files of SWAP through Collaborative Working Environment (CWE)

Bashyt – layered architecture

- Service layer
  - it is the base system layer. Service layer offers access to different services: web server, application server, database server, GIS server, etc.
- Interoperability layer
  - contains functionalities and protocols for interoperability services
- Application layer
  - supports the user interface



gSWATexe – Hydrological Scenarios Execution

- Main features
  - Web based application
  - GRID based processing
  - Able to execute SWAT based scenarios
  - Complete scenarios execution management solution
- Functionalities
  - Create a scenario execution description
  - Upload necessary data (model description files)
  - Monitor the execution process
  - Download results

Bashyt and gSWATexe cooperation

- Advantages
  - Users will have the ability to develop scenarios using Bashyt functionalities
  - At execution time gSWATexe uses Grid capabilities to speed up the processing for large scenarios
  - After execution, the results can be visualized using Bashyt dedicated modules
- Difficulties
  - Bashyt and gSWATexe are two independent applications
  - Improve user experience by avoiding large files transfer through the internet (download and upload actions)

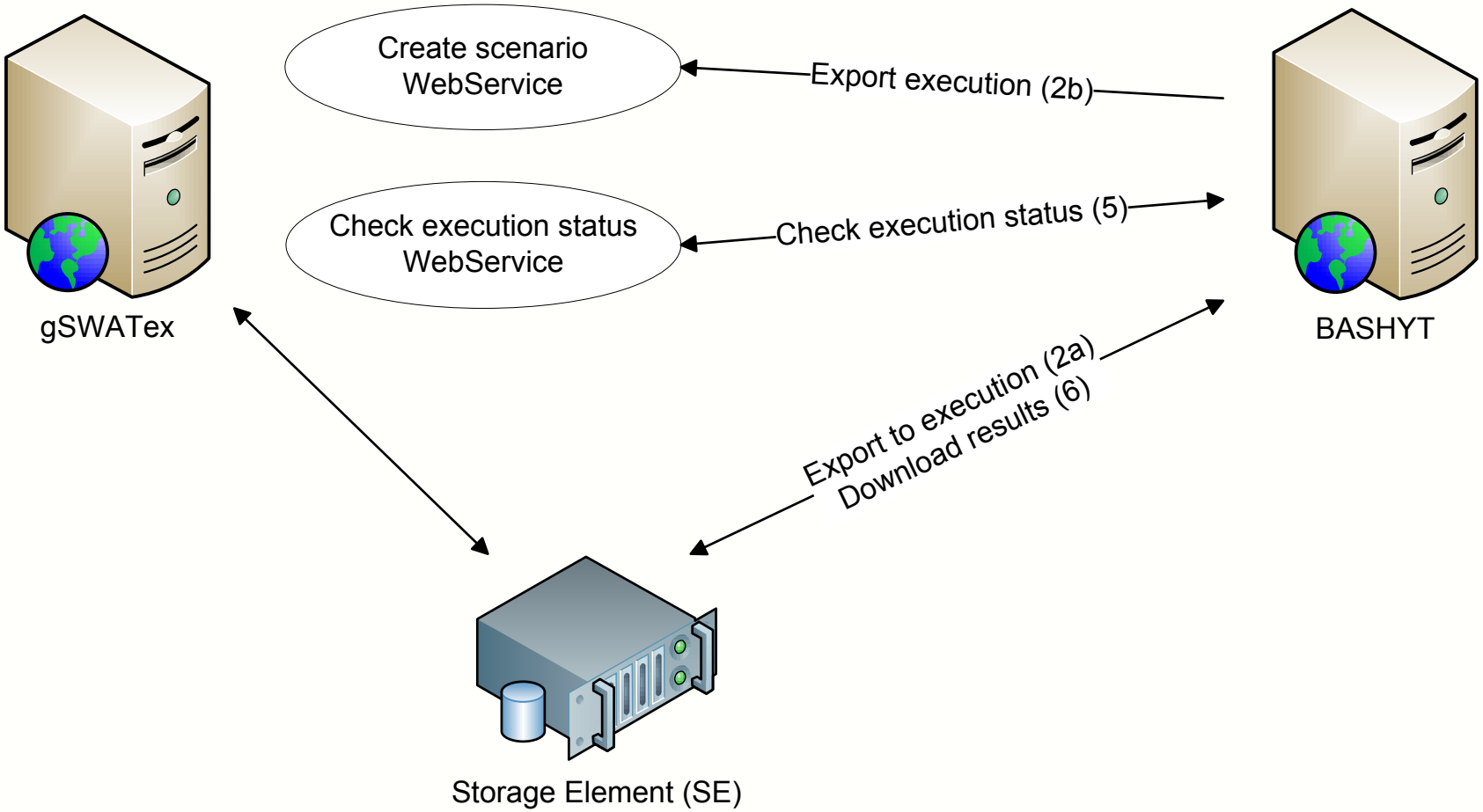
Bashyt and gSWATexe interconnection solution

- Interconnection scenario 1:
  - The applications “work together” through users actions:
    - Define the scenario
    - Download scenario files from Bashyt
    - Upload scenario files to gSWATexe
    - Execute the scenario
    - Download scenarios result data
    - Upload the information into Bashyt
    - Visualize the data

Bashyt and gSWATexe interconnection solution

- Interconnection scenario 2:
  - The applications “work together” through a common Storage Element and dedicated Web Services
    - The user defines the scenario
    - Bashyt provides an “Export to gSWATexe” functionality
      - The data is transferred to the Storage Element
      - Through the dedicated Web Service the execution environment is customized
    - Execute the scenario
      - Scenario execution progress can be monitored directly in Bashyt
    - Visualize execution data
      - After the execution is finalized, the results will be available automatically into Bashyt for visualization

Scenario 2 architecture



Conclusions

- It is faster and more reliable to interconnect the two applications providing complementary functionalities than to redevelop one of the solutions into the other
- The interconnection of the two applications will provide the users with a complete solution for large scale scenarios editing and execution
- Scenario 2, although requires slight modification of the two programs, leads to a more robust functionality and increased efficiency for the user

Thanks, Questions

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