JOANNEUM RESEARCH

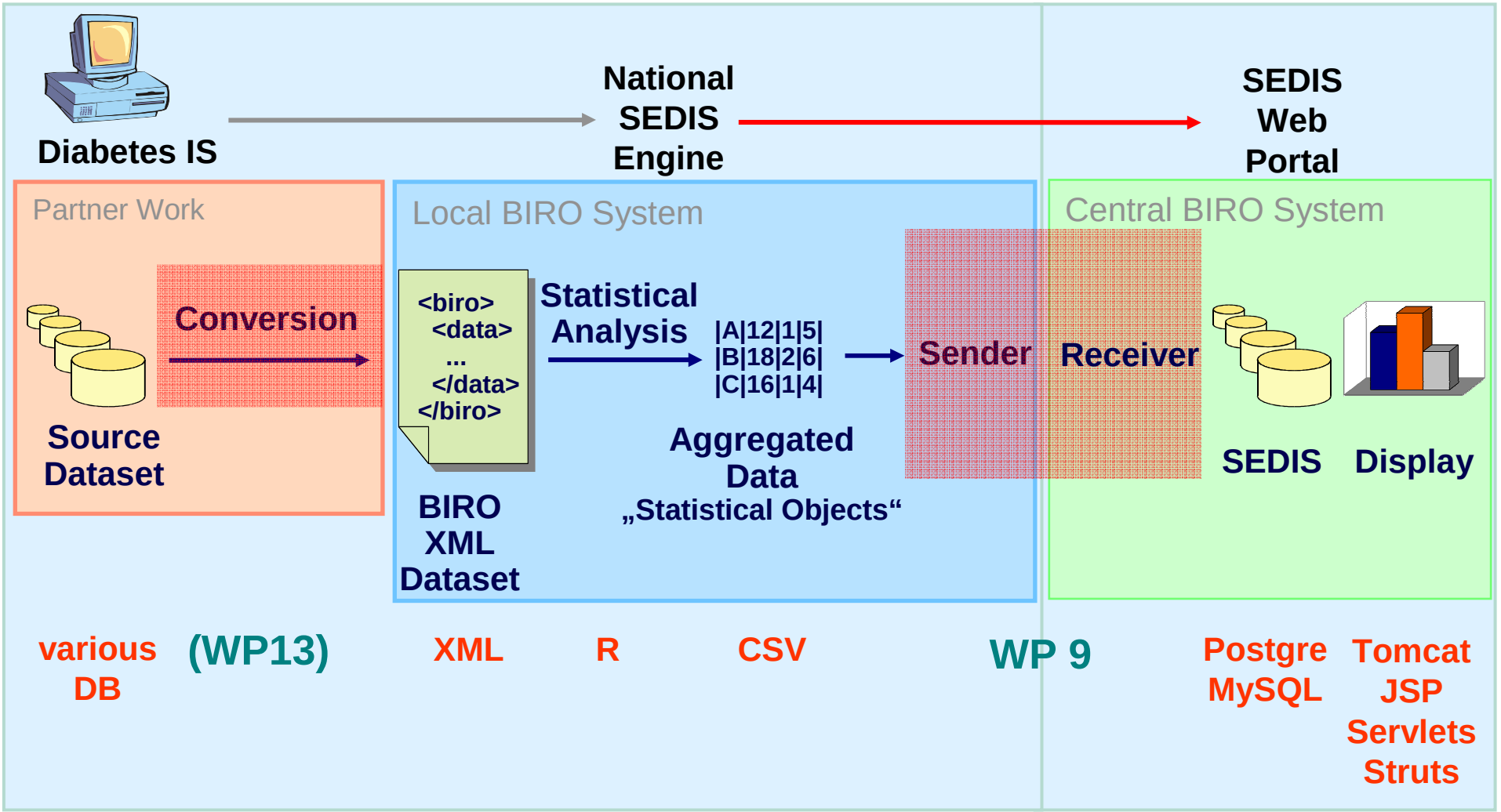
BIRO WP 9
Communication Software

Technology Selection and

Results from Pilot Implementation

Joanneum Research

B.I.R.O. Architecture



sedis…shared evidence-based information system

WP9 – Communication Software
Chosen Technology

- **Web-Services**
  - ➔ Use SOAP Message Standard
    - *Open W3C standard*
  - ➔ SOAP messages are XML files
  - ➔ Transport protocol is HTTP(S)
  - ➔ Open Source SOAP frameworks exist for J2EE platform
    - *Apache Axis2*
  - ➔ Implementation of XML encryption (XMLenc) and XML signature (XMLsig) standards
    - *Apache Rampart*
  - ➔ Web-Services are an open, platform independent Standard (e.g. available as well on .NET platform)

WP9: Communication Software
Tools and Libraries used in pilot

- Java 2 Enterprise Edition
- Apache Tomcat (Servlet engine)
- Apache XMLBeans (Object to XML mapping)
- Apache AXIS2, Apache Rampart (SOAP + Security)
- WSDL2Java (Code Generation)
- Apache Struts (Sample frontend for BIRO dataset upload)

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Technology Evaluation

- **Design and Implementation**
  - ➔ Setup of two J2EE Applications (Sender and Receiver)
  - ➔ Sample services implementation
    - *Sender and receiver services (utilizing code generation)*
  - ➔ Axis2 Configuration
    - *Encryption*
    - *Signature*
  - ➔ Tests
    - *Secure data transmission using sample service*
    - *Performance measurements*

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Security

- **Authentication / Authorization**
  - ➔ Public Key Certificates
- **Confidentiality**
  - ➔ Encryption HTTPS / SSL
  - ➔ Encrypting XML content before submission using XMLenc
- **Integrity and Non-Repudiation**
  - ➔ Provided by signing the content before submission using XMLsig by sender

WP9: Communication Software
Preliminary Results

- **Technology suitable for application in BIRO**
  - ➔ Secure, open standard, platform-independent
- **Sender and receiver pilot applications are set up**
- **Pilot service for secure data transmission successfully set up**
- **Performance**
  - ➔ Remarkable communication overhead
  - ➔ Implications for use in BIRO?
    NO, due to low frequency of uploads

WP9: Communication Software
ToDo

- **Specification of data exchange format**
- **Platform selection**
  - ➔ Will local/central BIRO systems be J2EE applications?
    - *YES: easy integration*
    - *NO: interface specification required*
- **Workflow implementation**
  - ➔ Data import / data input (WP 8)
  - ➔ Local data analysis (WP 8)
  - ➔ Data transmission (WP 9)
  - ➔ Data analysis update on central system (WP 10)

Next Steps
Integrate it !!

- **BIRO Adapter ... OK**
- **Database Engine Import ... OK**
- **Database Engine Export / Data extraction ... TODO**
- **Local Reports ... OK**
- **Central Engine Import ... TODO**
- **Central Engine Reports ... TODO**

Architecture decisions

- **Database Engine - type of application**
  - ➔ client application
  - ➔ server application
- **Central Engine - type of application**
  - ➔ stand-alone application
  - ➔ server application