TextGrid und Service Oriented Architecture

GLDV Früjahrstagung 2007
TextGrid-Workshop,
Tübingen, 12.4.2007

www.textgrid.de

Peter Gietz, DAASI International GmbH

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Agenda

- 14:00-14:05 Einleitung
- 14:05-15:00 Marc Küster,TextGrid als digitales Ökosystem: eHumanities meets eScience
- 15:00-15:30 Werner Wegstein, Wie kann TextGrid die Fachwissenschaft verändern – Philologische Edition
- 15:30-16:15 Andrea Zielinski, TextGrid für die Korpuslinguistik
- 16:15-16:30 Kaffeepause
- 16:30-17:15 Peter Gietz, TextGrid und Service Oriented Architecture
- 17:15-18:00 Diskussion über Erwartungen der Fachwissenschaften an TextGrid

Overview

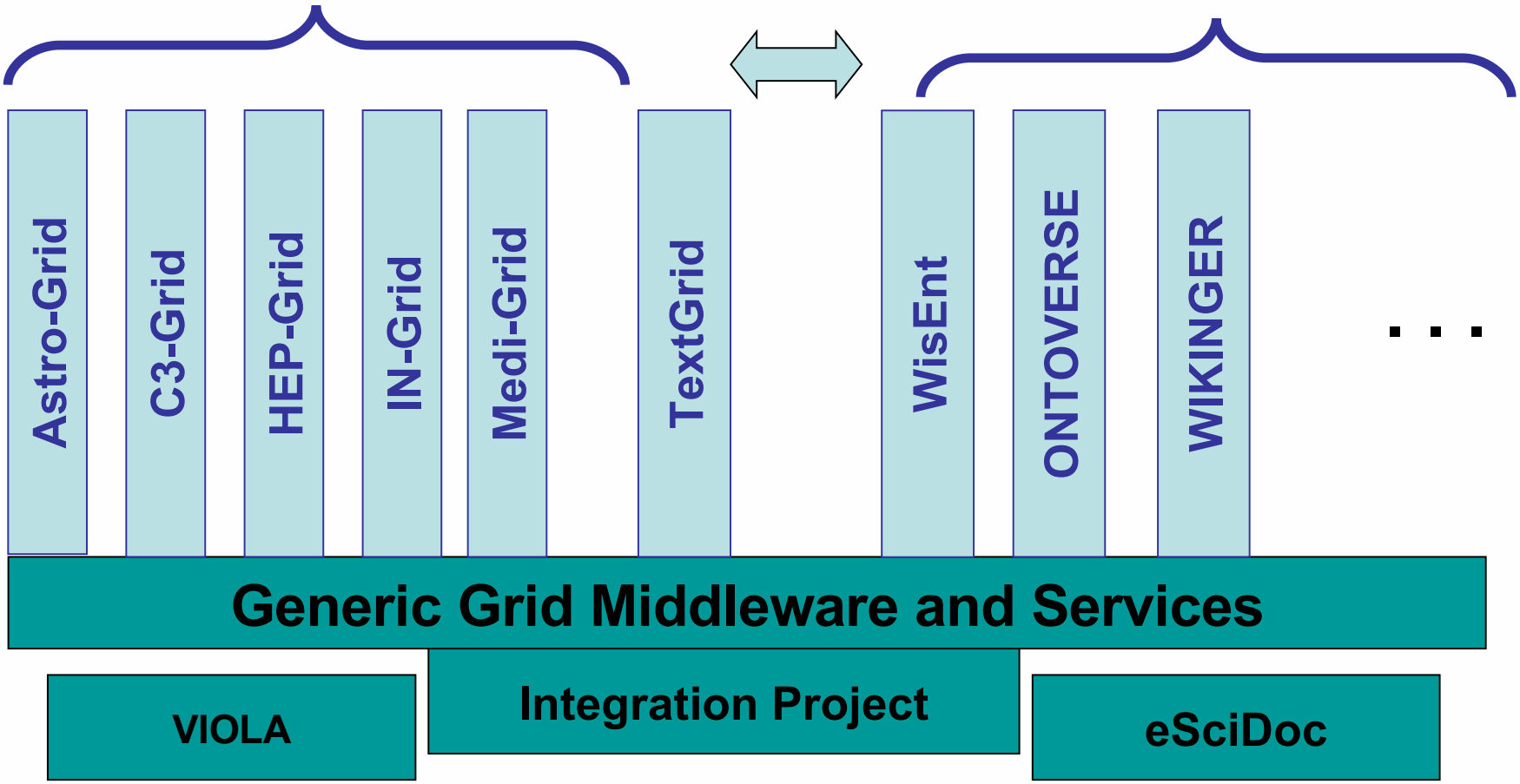
- **TextGrid, Humanities and Grid Computing**
- Objectives and requirements
- Technology

BMBF e-Science Programme

- 2005 - 2009
- 100 institutions
- 100 Mio Euros
- focus areas:
  - e-Learning (June 2004)
  - D-Grid (August 2004)
  - Knowledge Networking (November 2004)

Federal Ministry
of Education
and Research

D-Grid + Knowledge Networking



What about sustainability?

- Different models for a post government-funded grid infrastructure for eScience and eHumanities
  - single researcher has to pay for each job
  - DFN model: universities pay a flat rate
- The second seems to be more realistic

Humanities Computing

- From the 1960s onwards humanities use Computer for their research
- Tools can be summarized into 3 Groups:
  - highly specialized Project specific Tools
  - general purpose text processing tools
  - modern scripting languages (very general purpose)
- An important step has been the standardization of the scholarly text markup language TEI

Web Services and Grid Computing

- Web Services Technologies have arrived in Humanities Computing, e.g.:
  - Tapor (www.tapor.ca)
  - DAM-LR (www.mpi.nl/DAM-LR)
- Science has established Grid Computing:
  - transparent access to Computing and Storage facilities in the network
  - used in, e.g. HEP to cope with Petabyte of data and complex data analysis algorithms
  - WS based standards are already there (OGF)

eScience and eHumanities

- eScience
  - a new form of network and Grid-based scholarly work and collaboration
  - allows for innovative research designs
- eHumanities
  - equivalent of eScience in the field of humanities
  - deployment of Grid-based infrastructure and network collaboration within Virtual Organizations
  - “e” also stands for enhancing, extending and enabling

TextGrid and eHumanities

- TextGrid establishes eHumanities in the field of scholarly text processing
  - deploying Grid and humanities Computing standards
  - providing distributed digital texts and processing tools for answering traditional and new questions with empirical methods
  - promoting research in a networked and interdisciplinary environment
  - developping a modular and open platform for scholarly text processing

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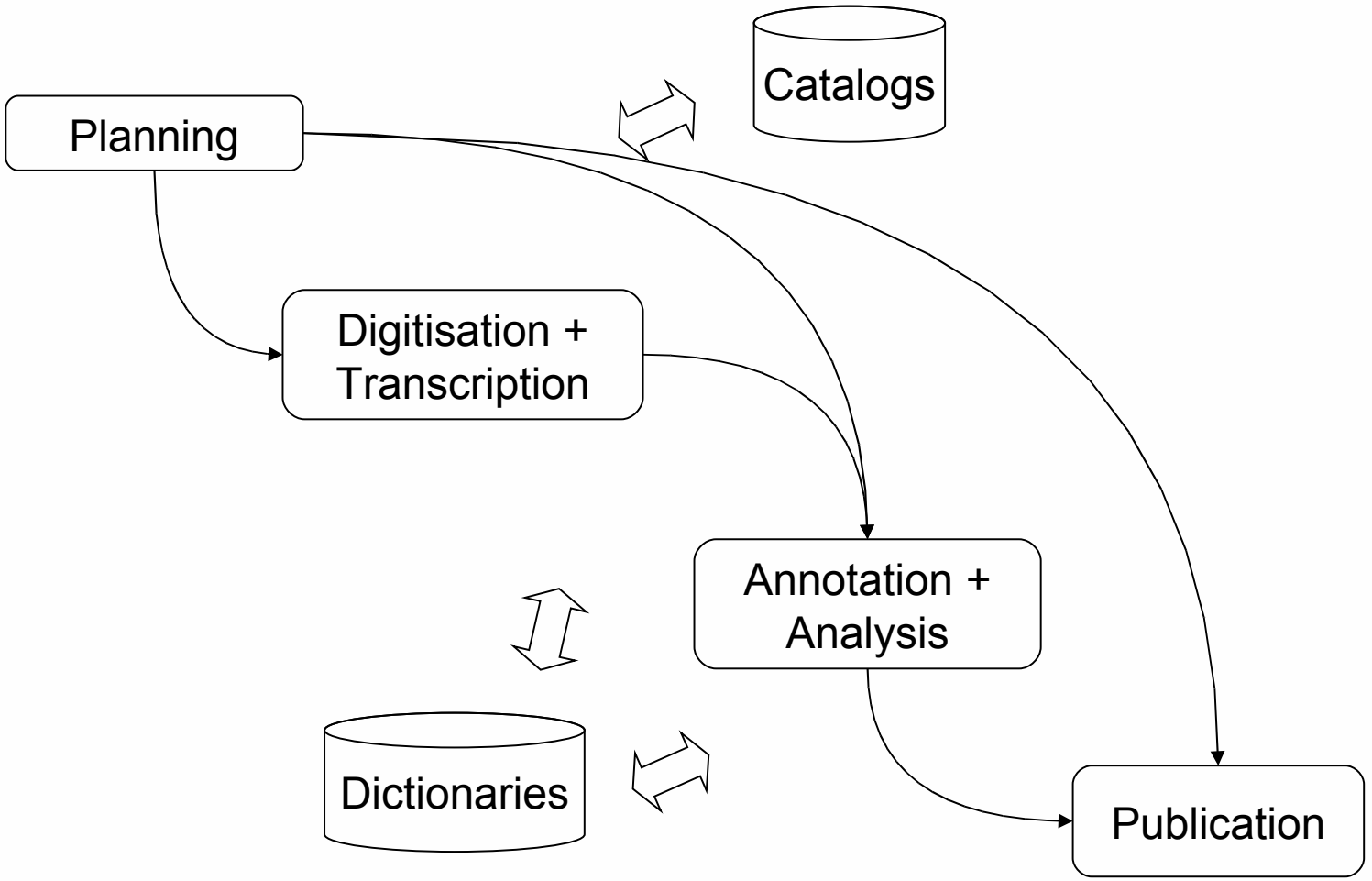
workflow


Catalogs
Planning
Digitisation +
Transcription
Annotation +
Analysis
Dictionaries
Publication

TextGrid goal

an open, adaptable, extensible infrastructure

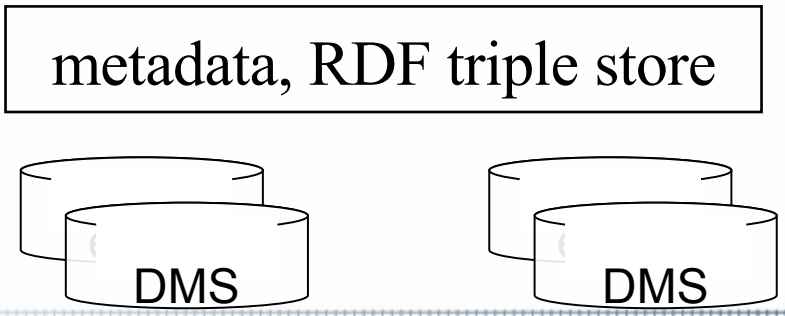
- combine isolated text corpora for re-use and collaboration
- enrich content with supplementary resources (dictionaries, catalogs)
- modular, to re-combine services for tailored tools
- foster automation on a semantic level

metadata

- bibliographic (title, author, ...)
- administrative (rights, ...)
- versioning (origin, audit-trail, ...)

→ object network

RDF triples – (subject, predicate, object)



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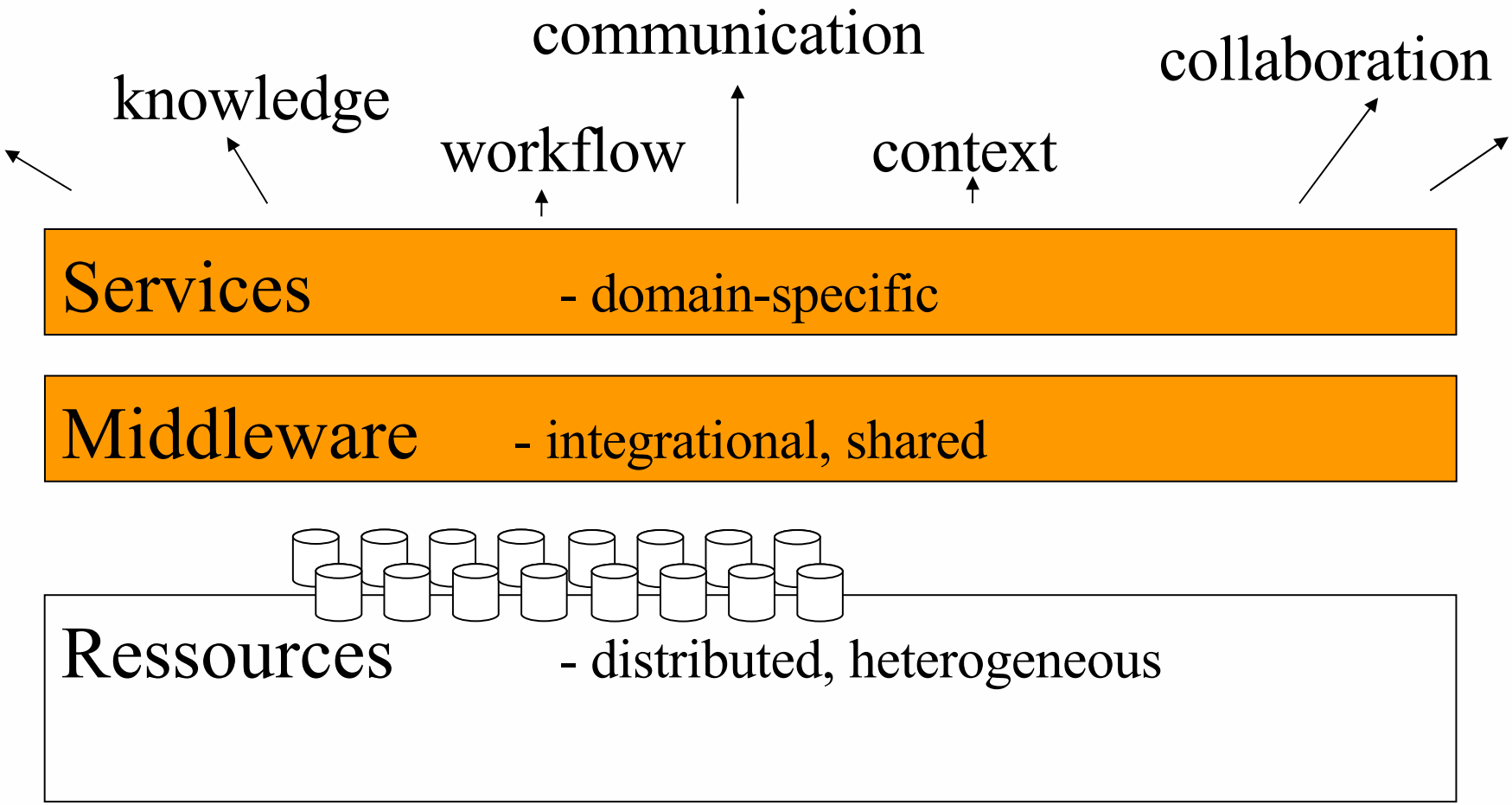
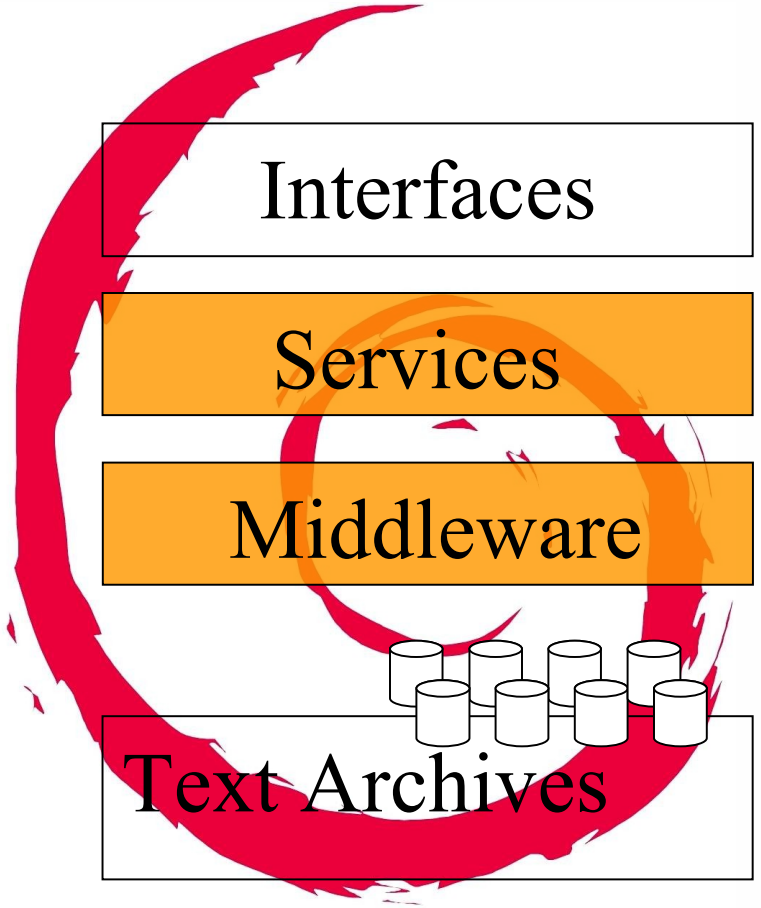
grid environment

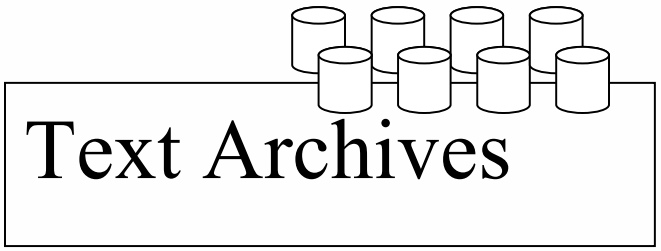


grid environment



Interfaces

- Graphical User Interfaces
  - Portal (GridSphere)
  - Rich Client (Eclipse)
- Providing a workbench
  - For configuring Services
  - specifying workflows
  - integrating interactive tools (editor, etc.)



- distributed, heterogeneous, autonomous data grid nodes
- integration (content, metadata)

$\forall \rightarrow$ interface to archives

$\forall \rightarrow$ policy

Services

- Proving encapsuled tools, e.g.
  - tokenizer, lemmatizer, dictionary services, streaming editor
  - workflow enacter
  - middleware interaction, e.g., registring and retrieving resources
- Based on standard (non-Grid) technology:
  - WSDL, SOAP
  - WSRF is handled in the middleware

Services = SOA

- Service Oriented Architecture
  - the new paradigm in IT
  - Web Services is the way to do SOA
- Mapping of organizational workflows
- SOA is infrastructure
  - Communication between processes
  - Registry of services
  - Orchestration of workflows
  - common security features

Middleware

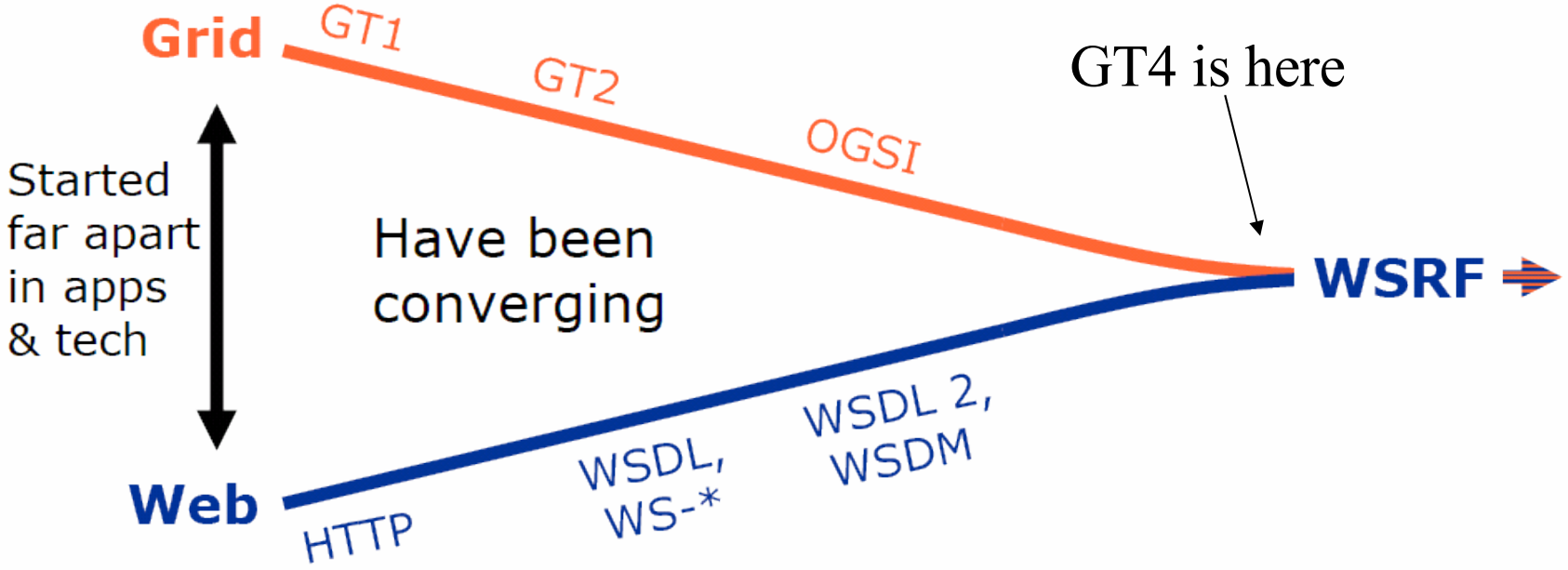
$\forall \rightarrow$ service layer

$\forall \rightarrow$ archives

$\forall \rightarrow$ D-Grid infrastructure

Middleware Globus Toolkit

- GGF/OGF-Standardization and Web Services development



GT4 and standards

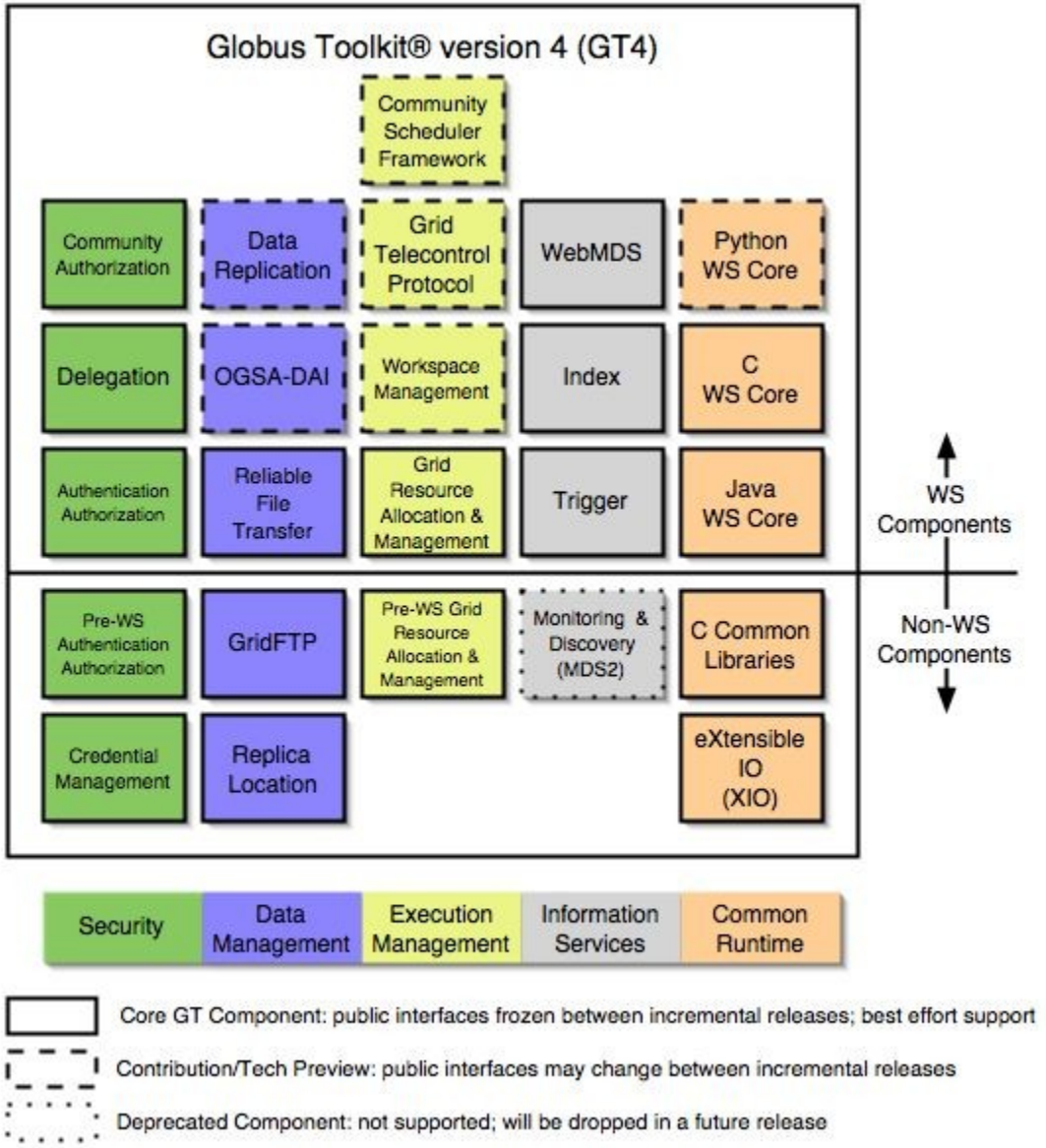
- SSL/TLS v1 (from OpenSSL) (IETF)
- X.509 Proxy Certificates (IETF)
- GridFTP v1.0 (OGF)
- WSRF and WS-N (OASIS)
- And others on the road to standardization:

  DAI, WS-Agreement, WSDL 2.0, WSDM, SAML, XACML

  http://www.mcs.anl.gov/~liming/primer/

Middleware GT4

http://www.globus.org/toolkit/about.html



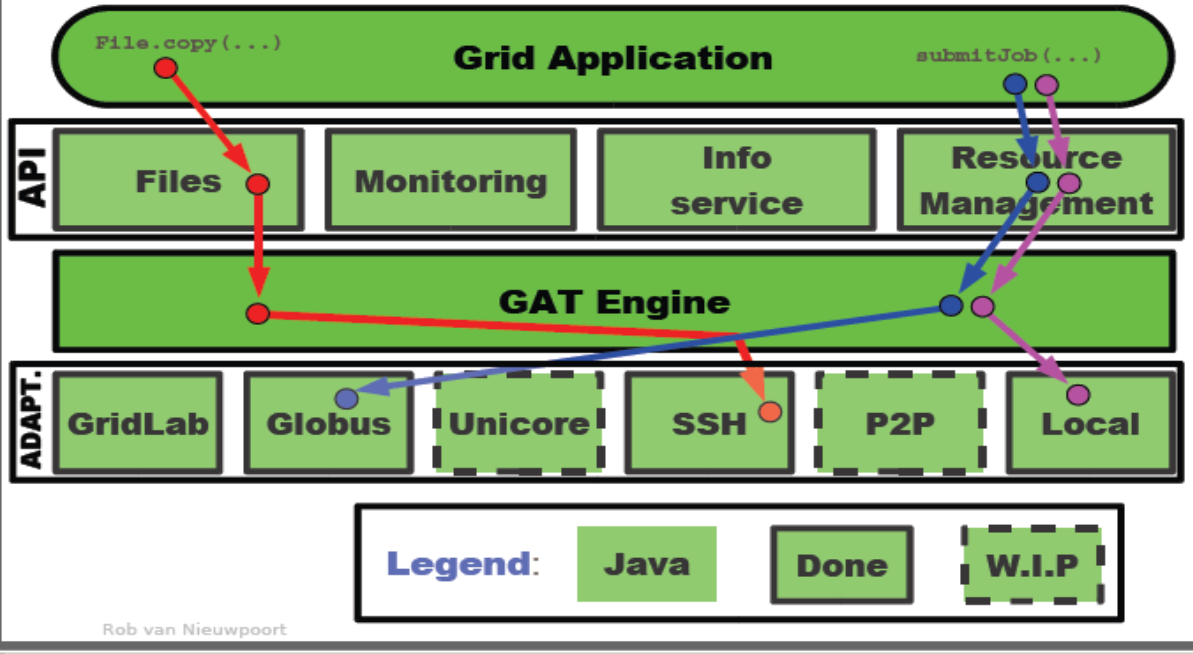
Grid Application Toolkit (GAT)

- GAT does not aim to replace existing “grid infrastructure.”
- GAT aims to provide a simple, clear interface to many different infrastructures
  - GRAM
  - Condor
  - Unicore
  - GridFTP
  - RFT…
- Open source, BSD-like licence

JavaGAT-tutorial.pdf (application/pdf Object) - Mozilla Firefox

http://www.cs.vu.nl/~rob/JavaGAT-tutorial.pdf

Java GAT Structure



Rob van Nieuwpoort

Saga

- The Simple API for Grid Applications
- OGF-Standard for GAT
- Lessons learned from GAT included
- Modularized
  - only SAGA core is finalized
  - https://forge.gridforum.org/sf/projects/saga-core-wg
- Implementations are on their way
- TextGrid plans to migrate to Saga

Middleware

Data Grid, Service Grid, Computational Grid

Information integration

→ static + dynamic meta/data, versioning

→ virtualisation, replica management

Security: AAI → GridShib (Shibboleth DFN-AAI)

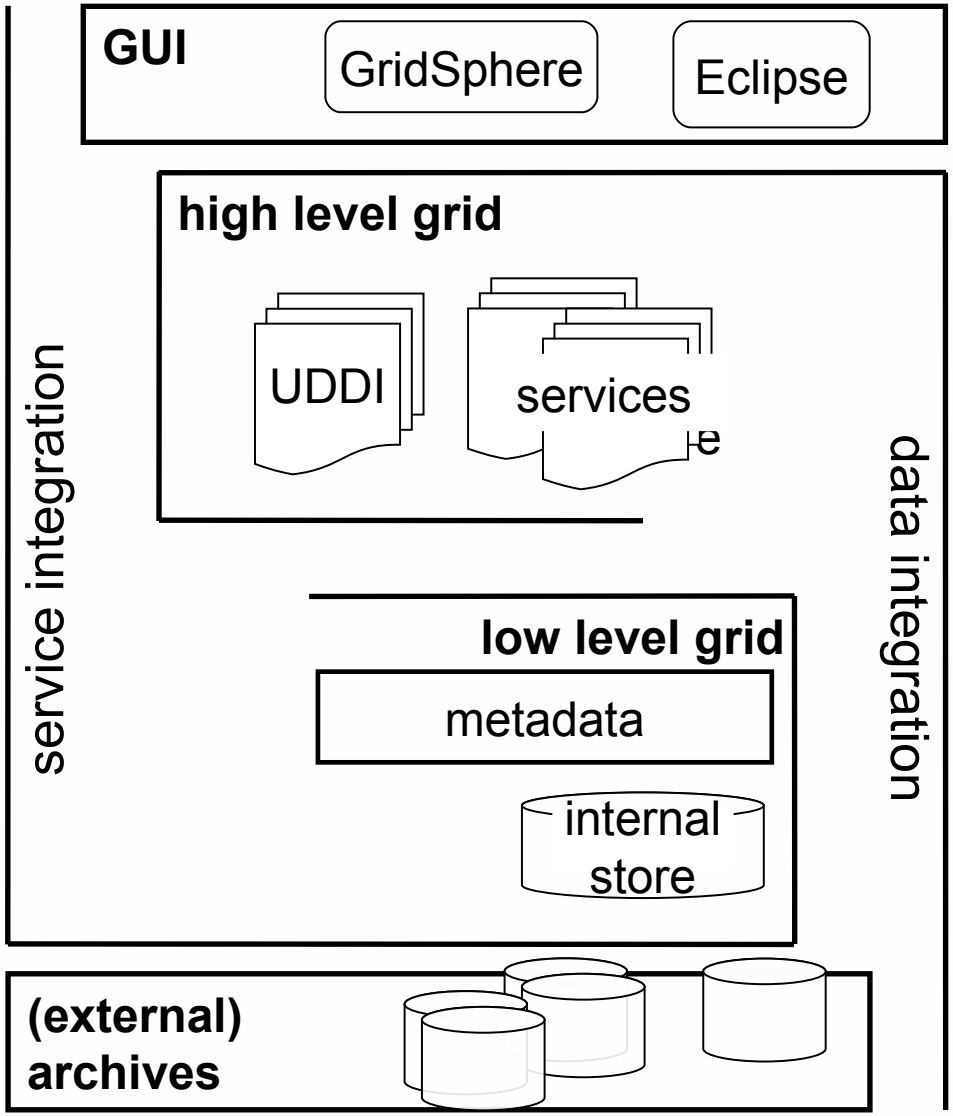
Workflow Management, Scheduling

Monitoring

License Management, SLA

…

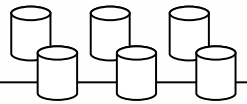
conclusions



Interfaces

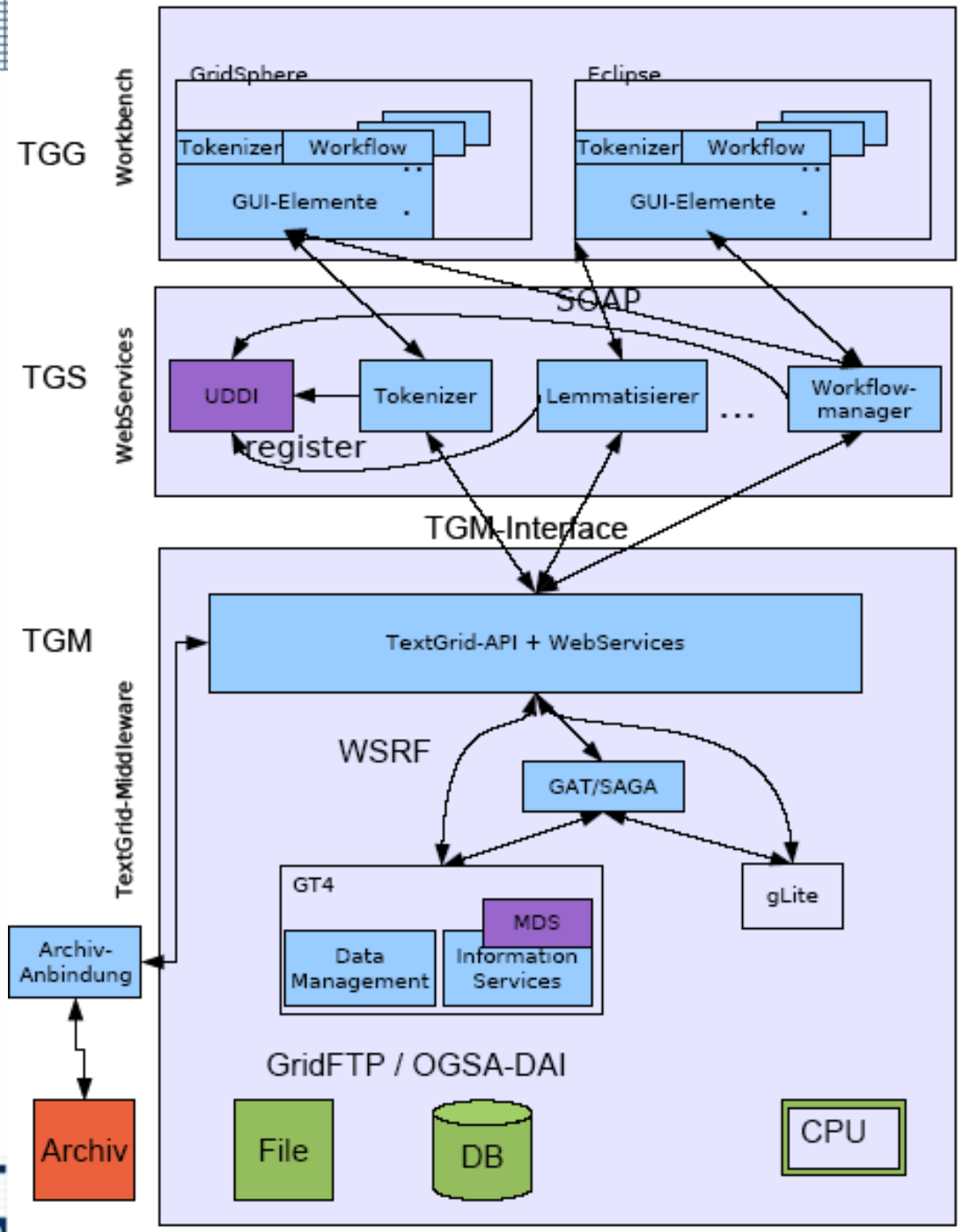
Services

Middleware



Archives

TextGrid architecture



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comments, questions, ... ?

thanks, for your attention !

TEXT GRID

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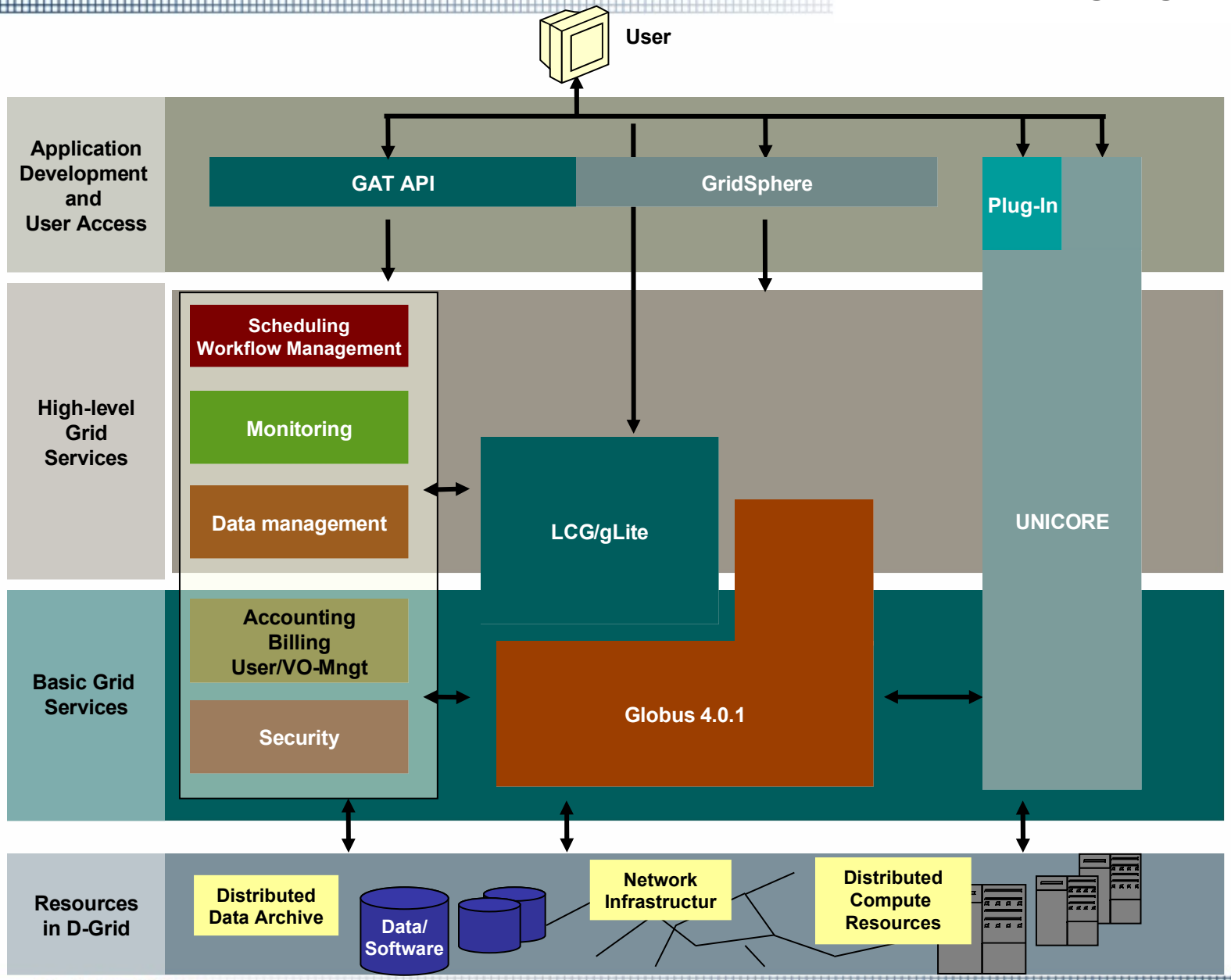
User
Application Development and User Access
GAT API
GridSphere
Plug-In
High-level Grid Services
Scheduling Workflow Management
Monitoring
Data management
LCG/gLite
UNICORE
Basic Grid Services
Accounting Billing User/VO-Mngt
Security
Globus 4.0.1
Resources in D-Grid
Distributed Data Archive
Data/ Software
Network Infrastructur
Distributed Compute Resources

~~non~~-hierarchic xml

<l> The IEEE (**<t>**eye **</l>**

<l> triple e**</t>** is first </l>

…

- annotation levels
  → typographic, structural, logic, semantic, text genetic, etc
- on-the-fly XML creation