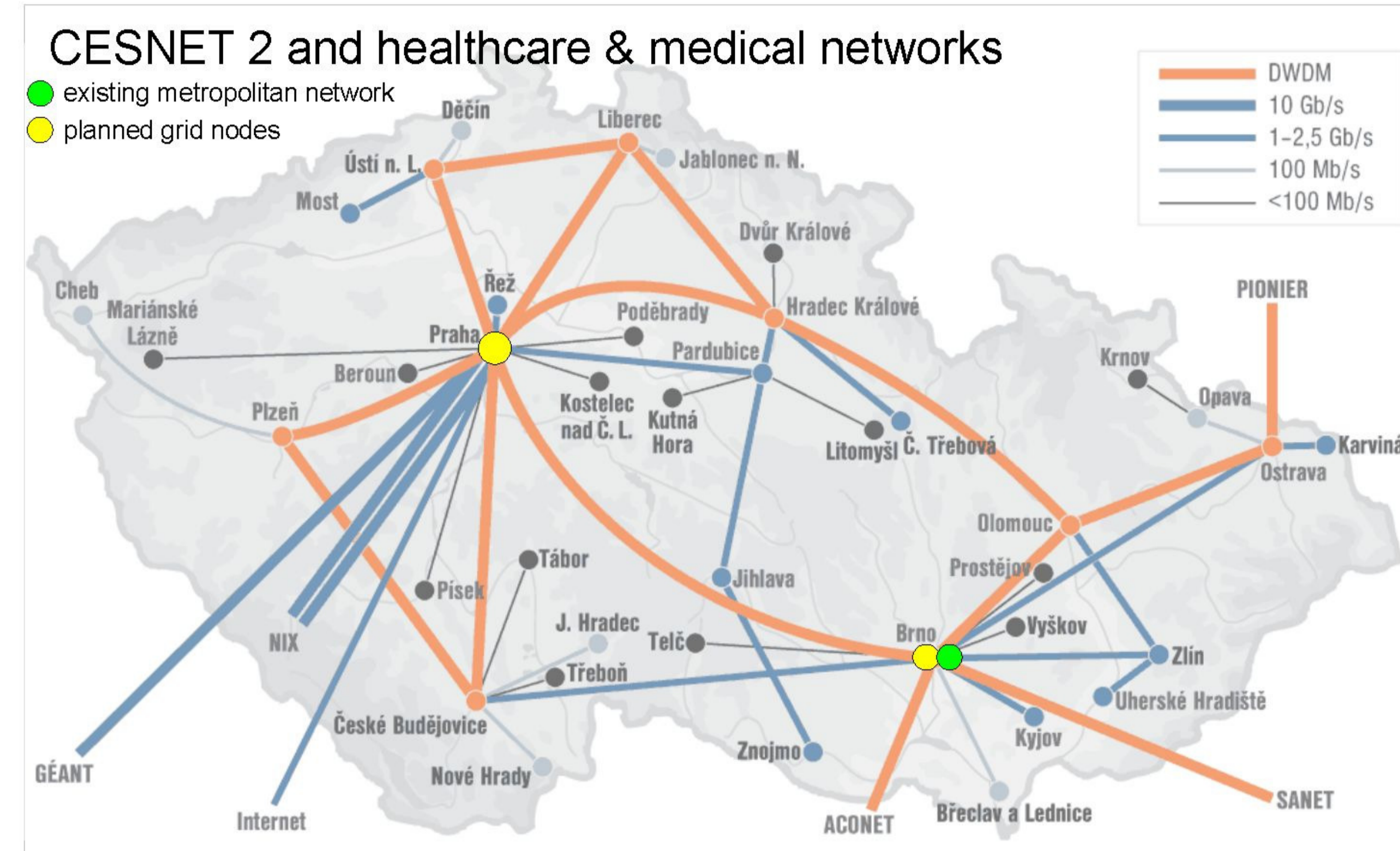


Tomáš Kulhánek, tomaton@centrum.cz, CESNET, Zikova 4, 160 00 Praha 6, Czech Republic  
 Milan Šárek, ms@cesnet.cz, CESNET, Zikova 4, 160 00 Praha 6, Czech Republic

**Short overview**

The aim of this paper is to introduce the pilot project of connecting research and enterprise PACS (Picture Archiving and Communication System) in the Czech Republic, which is deployed next to the existing Metropolitan PACS MeDiMed (Metropolitan Digital Imaging System in Medicine) using the service oriented architecture (SOA) style and grid technologies for distributed systems. This project follows the idea to build a decentralized system that can be used to exchange medical images.



**Existing metropolitan network MeDiMed[2]:**

- Connects enterprise PACS of several hospitals, healthcare providers and universities
- Interchange medical images in DICOM (Digital Imaging and Communications in Medicine)
- Metropolitan area in Brno
- Utilizes a central approach

**Issues:**

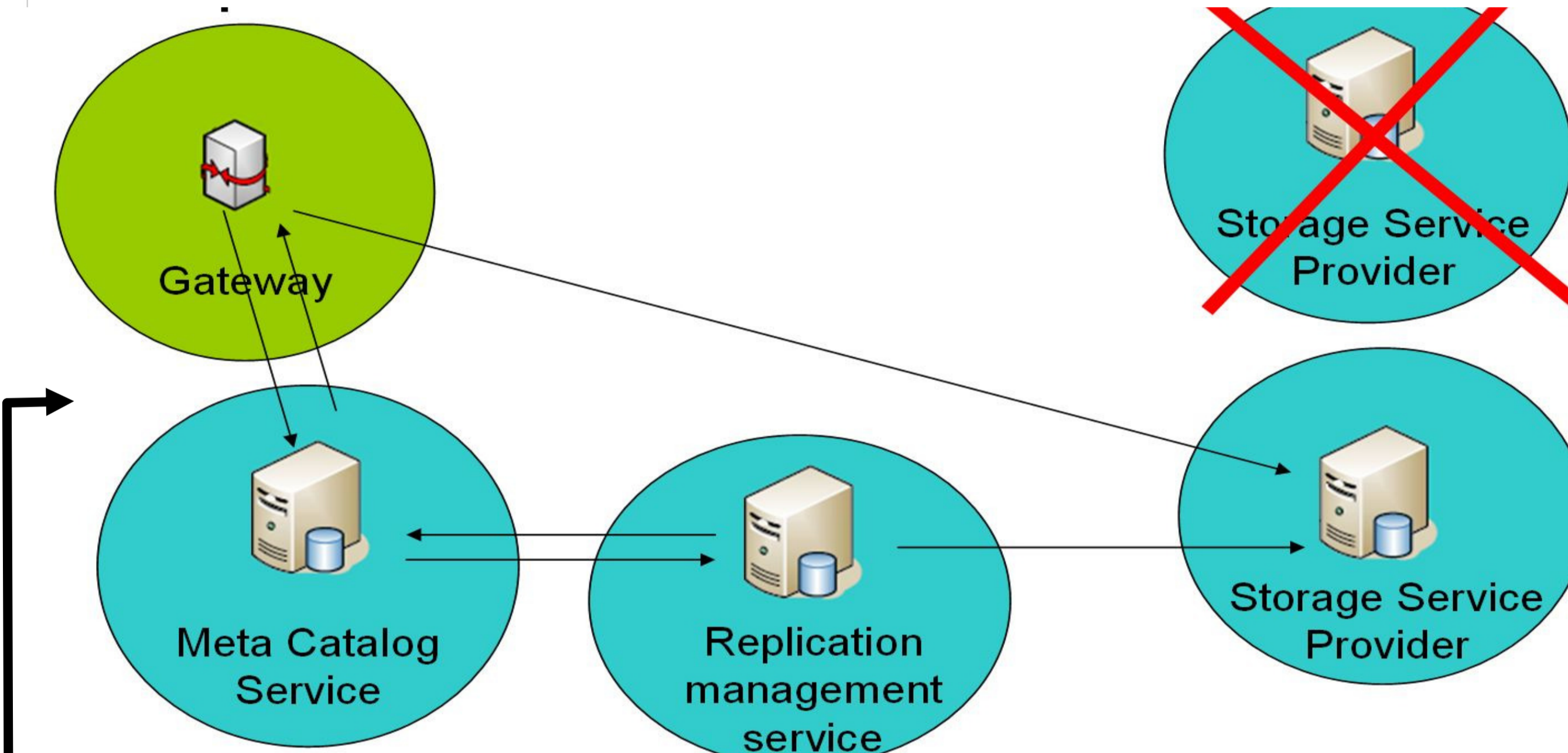
- Hardware capacity –high demand on central storage servers
- Security and access—nodes interconnected via secured peer to peer channels on high speed CESNET2 (national academic network)

**Developing pilot project:**

- Utilizes a data grid and decentralized approach
- functionality provided by services—follows service oriented architecture (SOA) [3]
- grid nodes interconnected via public channels on high speed CESNET2

**Issues:**

- Hardware—capacity shared among data grid
- Security—encrypted transport via public channels
- Access—ability to integrate decentralized authentication and authorization via Shibboleth

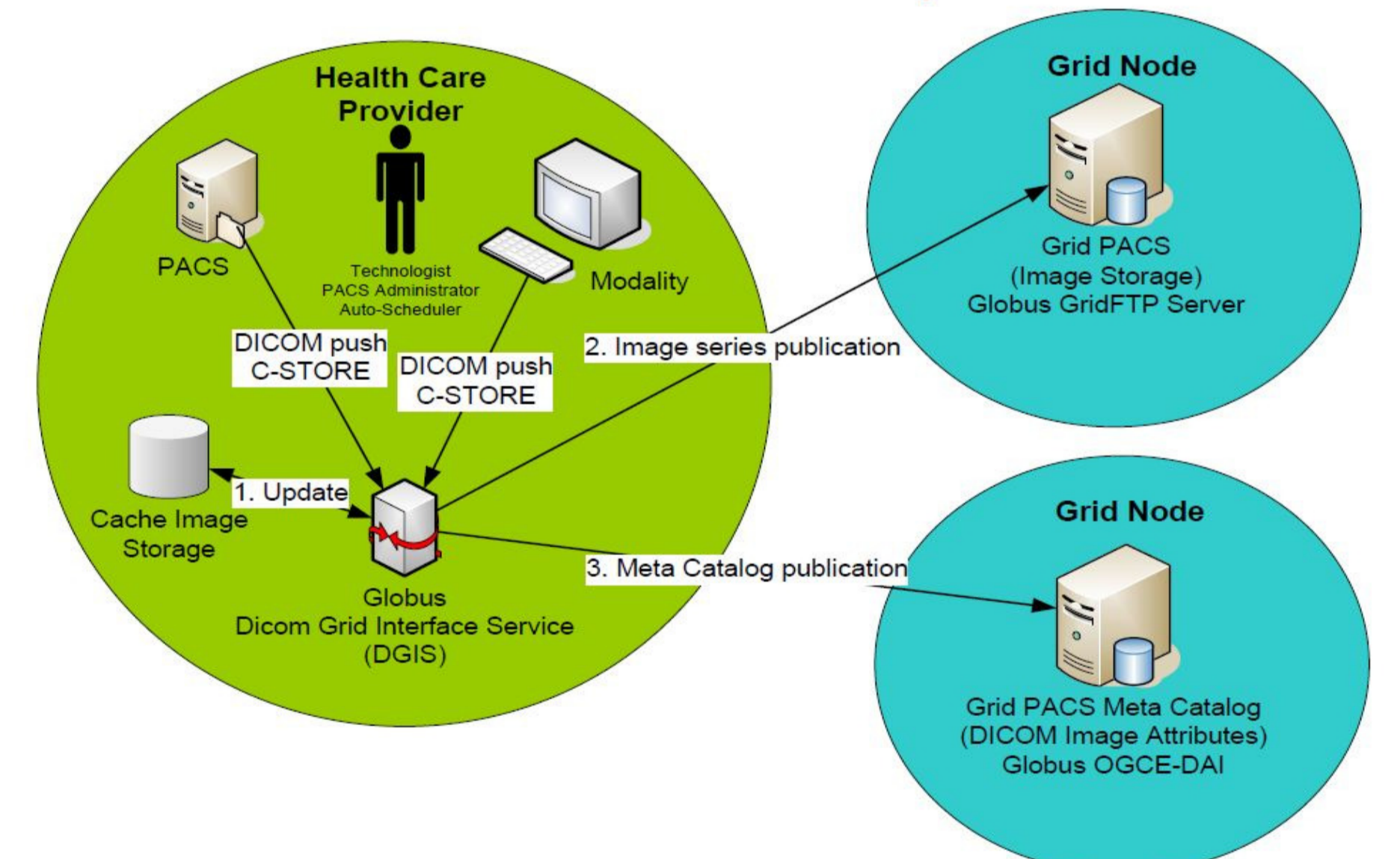


**Key features of researched solution used in pilot project:**

- opensource grid framework - Globus Toolkit
  - Replication
  - Failure recovery
  - Reliable file transfer
  - Secure communication among nodes
  - Service distribution among several grid nodes
- DICOM interface and metadata catalog services - Globus MEDICUS [4]
- Lightweight web based DICOM viewer [5]



**DGIS: Image publication DICOM C-STORE Operation**

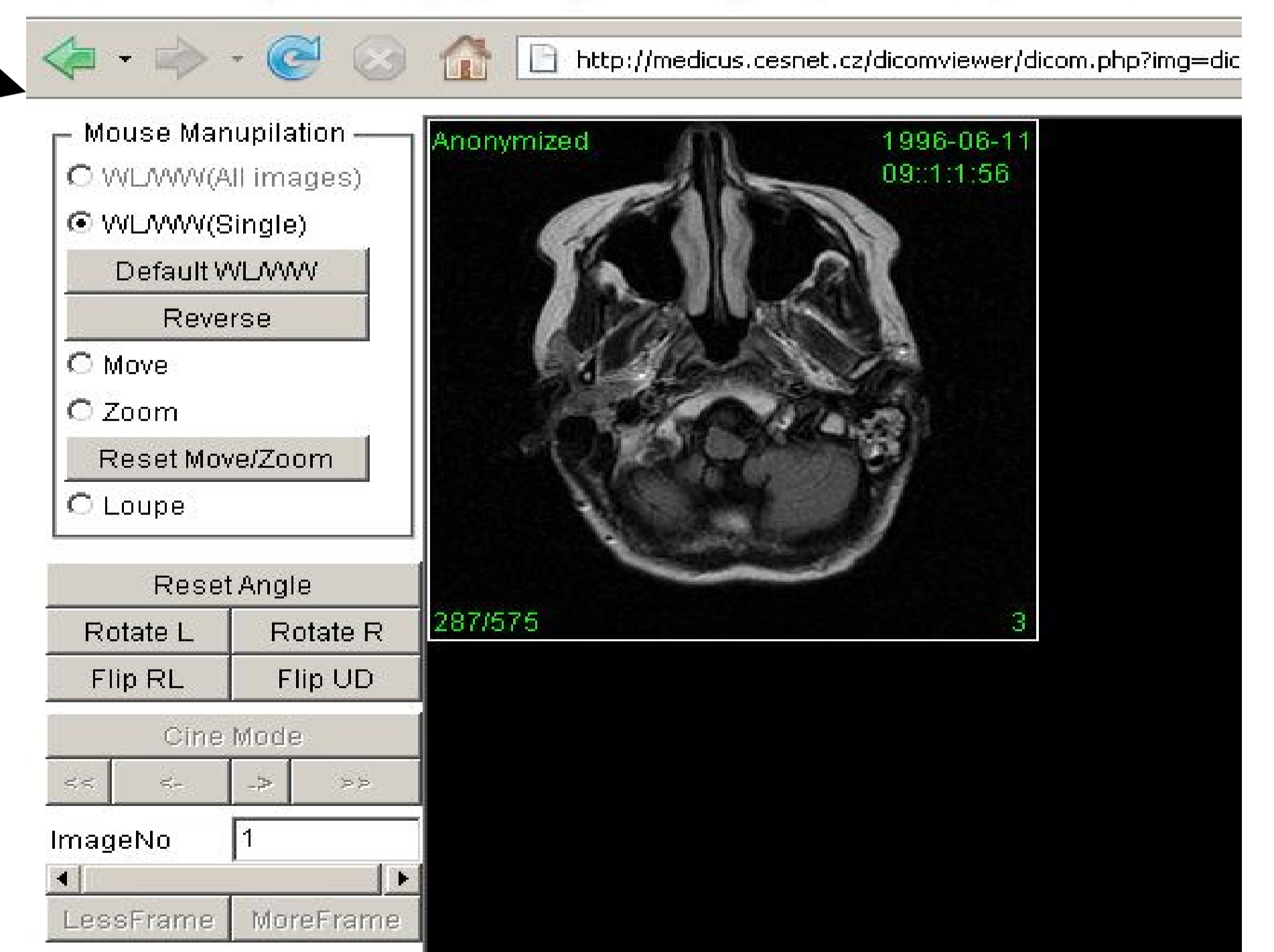


Globus MEDICUS Proto-Project @ <http://dev.globus.org/wiki/Incubator/MEDICUS>

**Conclusion & future plans**

The developed pilot project provides non-proprietary solutions for decentralized access to data capacity of data grid and provided services to access medical images following security and legal requirements.

The pilot project is now deployed to the high speed CESNET2 network. Each of the services is able to be deployed physically on different node. The encrypted interconnection via public channels is being negotiated between existing metropolitan PACS from MeDiMed in Brno, existing enterprise PACS of Central Military Hospital in Prague and the First Medical Faculty of Charles University in Prague.



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