Institute of Computer Science

Annual Activity Report 2000

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1. INFORMATION INFRASTRUCTURE AT MU

The MU information infrastructure consists of a number of sub-systems processing data from either the entire university and from local sources. The basic university-wide sub-systems supporting the university operation are linked into the *Set of electronic access devices to MU data.* Other sub-systems are linked to the MU IS more or less closely via data exports and imports (e.g. the library system with its loans module, the administration system of the university Computer Centre and the system of accommodation in the halls of residence), or are operated independently (the system of student canteens).

The major MU administration database

The core of MU data applications consists of three independent central databases operated on different servers under different database machines:

- the database of *economic, personnel and payroll data* (hereinafter *EkonPerD*; it was under development at the Institute since 1979 and contains primary MU accounting, personnel and payroll data)
- *the public MU Internet presentation* database (hereinafter *WebDB*); it was under development at the Institute since 1997 and contains all data for presentation - partially primary data and partially those reflecting the EkonPerDB and StuDB data)
- and the *studies and publication* data (hereinafter *StuDB*); it was under development at FI MU since the end of 1998 and contains the primary data of the student register and the register of MU publishing activities. Some data, particularly those regarding workloads and labour contracts of external teachers, are taken over from the EkonPerDB)

In overlapping data areas, the EkonPerDB and WebDB databases are integrated (partly on-line, on the principle of changes being carried out primarily in the EkonPerDB and then taken over into the WebDB). The integration of the EkonPerDB and StuDB (on the principle of mutual on-line reading and the reflecting changes) was already prepared at the end of 2000, and its first stage, i.e. the integration of basic personal data, was in the process of verification.

User access to MU data

The EkonPerDB database is accessible to a limited group of authorised individuals (from the Finance, Personnel, Payroll and Student Departments) mainly in text terminal mode, or under the graphic client in the case of new applications. Similarly, special applications over the StuDB data are accessible only to a limited number of authorised people from the Student Department. There is strong support to provide wider access to data for all people to whom the data relate: protected and differentiated user access not requiring anything but a standard user station (i.e. authenticated access through a standard WWW interface for which the client needs only a web browser supporting the https protocol) is being implemented at all three central MU IS databases. The user's interface to WebDB is the intranet subsystem *https://wwwdata.muni.cz/auth* (under development at MU ICS since 1998), while *https:/is.muni.cz/auth* (under development at FI MU since the end of 1998) and *https://inet.muni.cy/auth (Inet MU,* under development at ICS MU since 2000) are user interfaces to

StuDB and primarily to EkonPerDB, respectively. All three subsystems are generally meant to be used by all people registered in the MU personnel database, i.e. current and former employees, students and associates of MU, and using one common registration database of user passwords (part of StuDB).

Intranet Subsystem Inet MU – https://inet.muni.cz

Inet MU, whose development, in terms of the establishment of the university information infrastructure, was the Institute's main focus in 2000, provides access to selected data sets and applications:

- *Personnel and payroll data* (personal data, contact data, data related to employment, salaries, the plan for 2001 includes disclosure of data on agreements, overall payroll lists, etc.),
- *Finance* (financial lists of orders; and scholarships, lists of asset registers, travel orders, etc are under development),
- *University computer centres* (personal data, topical information on the rate of utilisation. Utilisation statistics are under development, an operation calendar, lists and overview statistics are planned), and
- *Document data* (libraries of selected categories of internal university documents).

Inet MU has been developed to enable access to data from various independent databases (in addition to primary EkonPerDB, it routinely uses WebDB for contact data and StuDB to verify authenticity of users). It is based on J2EE technology for server and distributed applications enabling the development of applications that can be run at any application server implementing the J2EE standard, and the definition of a common interface between the client and the data server (XML/XSLT) for the unification of data transfer between the application and presentation levels of the system architecture.

Internet presentation of MU – http://www.muni.cz

The Internet presentation of MU, *www.muni.cz,* has been under development at the Institute since 1996. It provides profile and detailed information in Czech and English on all units of the university (academic management and profile, structure and profile of studies and positions, employees and students, science, research and publishing activities, calendars of important events, vacant positions, legal standards, etc.) on the principles of common information contents, common presentation form and automatic information take-over from MU IS databases. The presentation has been built on the WebDB database whose primary contents are enhanced and updated by authorised administrators from all MU units through the intranet subsystem *https://wwwdata.muni.cz/auth*, and extensive data sets mirrored from the EkonPerDB and StuDB databases are – without any intervention – regularly updated in batches.

In 2000, the MU Internet presentation was made accessible also to the users of mobile phones supporting the WAP technology at *wap.muni.cz*. This server uses the same database as www.muni.cz, i.e. WebDB, and on its pages provides basic information including contact data (telephones, faxes, addresses) to all offices, employees and students of the university. The results of the entrance examinations were also made public in wap.muni.cz (as in www.muni.cz) and at the end of the year a new page was added providing information on topical utilization rates of the university-wide computer centre.

2. ACCESSIBILITY OF MU INFORMATION SOURCES

In the second half of 2000, there was a major change in terms of the opportunities for users from MU to gain access to professional electronic information sources for science, research and education, particularly due to the grants from the LI programme of the MoEYS. The current offer available at MU includes more than ten top-level extensive sources (access to others is being prepared), accessible via standard www browsers at http://www.muni.cz/library/sluzby/:

- Web of Science – ISI's citation and bibliographical database containing data on articles from over 8,000 top world scientific and professional journals and magazines from all areas
- ProQuest 5000 – full texts from approximately 5000 topical periodicals and bibliographical records and from another 3000 periodicals covering humanities, medicine and applied natural sciences
- PCI – bibliographic data of archived articles from 3388 scientific periodicals covering humanities from 1770 to 1993 (currently over 15 million entries)
- EIFL Direct – full texts from 3248 scientific journals, newspapers and news bulletins published by EBSCO, and from 1305 reference books, in particular from the field of humanities
- JSTOR – full texts of 117 key US scientific and humanities journals (from philosophy and finance to mathematics) ranging from the first issue to the present day minus 3-5 years
- Biological Abstracts, Zoological Records – references to articles from almost 6000 journals from the area of life sciences and 4500 journals concerning animal species research
- Springer-LINK – over 400 scientific and professional journals published by Springer-Verlag
- Springer-LNCS – on-line version of collections of Lecture Notes in Computer Science published by Springer-Verlag
- ACM Digital library – full texts from approximately 30 journals of ACM, an American computer association and full texts of proceedings of scientific conferences organised by the ACM since 1985
- ETRDL – distributed digital library of technical papers from CompSci and Mathematics from European and American universities and research institutes
- KnowEurope – an extensive source of integrated information on the EU and Europe

The above information sources are the major electronic sources but not the only ones accessible to the users at MU. Access to the other existing sources, however, is limited: they are either accessible only for specialists of particular disciplines (e.g. the structural and reaction database Beilstein and Gmelin for organic and inorganic chemistry or the database of Greek and Latin authors for the specialists from Classical Studies at the Faculty of Arts) and/or by means of special client programmes (e.g. the database on the university CD-ROM server - Czech National Bibliography, BookFind, Ulrich´s International Periodicals, Economic and Legal Information Service and others).

3. INVOLVMENT IN THE EUROPEAN HIGH-SPEED NETWORKS PROJECT

The Institute operates the PoP (Point of Presence, the main access point) of CESNET, the high-speed network, with a connection to Prague at the rate of 2.4 Gb per second. Through the CESNET association, MU employees are actively involved in the issues of national high-speed networks, and MU thus participates in the building of the TEN-155 pan-European network and currently also in the GEANT project.

The staff of the Institute is also involved in the pan-European project of the 5th framework programme DATAGRID. Its objective is to establish an efficient computer infrastructure to process the results of experiments performed at CERN.

4. COMPUTER TECHNOLOGY AT MU

Supercomputer Centre

The Institute operates the Supercomputer Centre (SCB) equipped with a 40-processor SGI Origin 2000 computer and a 12-processor SGI Power Challenge computer. Both computers are inter-linked by a high-speed connection HiPPI.

Origin 2000 is the most efficient computer with shared memory installed in the academic community in the Czech Republic and, in addition, is equipped with the most efficient graphics system – Reality-Infinity2. The SCB has for its further disposal disc areas in the range of approximately 1 TB and offers these systems to the wide academic public of the Czech Republic. The SCB staff are involved in MetaCentrum, an international project, where they play a key role. As a participant in the project, MU has a tape library at its disposal with a capacity of 12 TB and from 2000 on, also a PC cluster with 32 Pentium III 700 MHz processors and 16 GB memory connected directly to the high-speed back-bone.

MU Computer Centre

The MU Computer Centre was established and opened in 2000 to serve the needs of the entire university. There are over one hundred PCs with Pentium III 533 MHz processors, 128 MB operating memory, a hard disc, floppy disc drive, CD-ROMs and 17" monitors in round-the clock service, 24 hours a day, seven days a week. The computers run the MS Windows 2000 operating system. The users may use a number of applications which are being gradually enhanced and supplemented to cover the basic needs of the majority of the users and thus to fulfil the centre's mission. The centre is well connected to the Internet and MU information sources.

The MU backbone computer network

The Institute also operated the main connection point of the TEN-155 network to the Brno Academic Computer Network (BAPS). During the second quarter of 2000, the problems of the TEN-155 back-bone related to the application of the new technology (optical fibre route 2.4 Gb per second to Prague and related equipment) were eliminated. As a result of further development of the metropolitan back-bone and significant adjustments of the topology at the network level, the reliability of the metropolitan network was significantly improved.

Simultaneously, potential components were being conceptually prepared and tested with the aim of applying gigabyte technology in the MU backbone network.

Important servers in the MU network administered by the Institute

- SGI Origin 2000 – supercomputer
- SGI InfiniteReality 2 Onyx 2 – graphics superprocessor
- SGI Power Challenge XL – supercomputer
- Sun Enterprise 450 – server of the economic and personnel part of the MU Information System
- Sun Enterprise 450 – server of the distributed file system (AFS) and the high-capacity backup system
- SunServer 1000 – MU network services (www, ftp, etc.) and the Librarian Information System server
- Dell Power Edge 4100/200 – CD ROM server
- Dell Power Edge 2300 – remote access server to applications running under Windows
- Sun UltraSparc 1 – MU main electronic mail server
- Sun Enterprise 250 – CPS administration server

- Dell Power Edge – CPS data server
- Dell Power Edge – CPS network server

The university has over 2600 computers in service, connected to the university computer network.