Replace or Integrate?
Decision Support for Building a Federated Configuration Management Database

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Leibniz Supercomputing Centre (LRZ)

- Owned by the Bavarian Academy of Sciences and Humanities, organisational attributed to the “committee of informatics”
- Staff: around 175 employees
- Located in Garching (near Munich)
Leibniz Supercomputing Centre (LRZ)

Service portfolio:

- **Provider of IT Services for scientific and academic institutions in the Munich area (munich scientific network)**
  - more than 80,000 students
  - more than 26,000 employees

- **Regional Computer Centre for all Bavarian Universities**
  - Backup and Archiving Centre (10 petabyte, more than 6 billion files)
  - Competence centre (Networks, HPC, IT Management)

- **National supercomputing centre (for all German universities)**
  - Gauss Centre for Supercomputing
  - Integrated in European HPC and Grid projects
Munich Scientific Network (MWN)

- More than 60 locations with over 440 buildings
- 500 km fibre optic cable connecting these buildings
- More than 1,300 active network components connecting over 68,000 systems (servers, workstations, printers, etc.)
- More than 1,200 wireless access points (WLAN)
Motivation: Orientation to IT Service Management

- Diverse vertical range of service provisioning
- Heterogenous service portfolio (continually expanding)
- Increasing criticality of services
- Increasing scope, volume and complexity of services

- Demands stricter quality requirements

- LRZ is currently introducing IT Service-Management (ITSM) processes according to ISO/IEC 20000 (with a new ITSM tool)
  Goal is the ISO/IEC20000 certification for the organisation
Short overview of ISO/IEC20000

- Process orientated IT Service-Management
- International standard, possibility for person/organisation certification
- Uses best practices of ITILv2, MOF, Cobit
- Consists of 13 processes:

  Service Delivery Processes
  - Capacity Management
  - Service Continuity & Availability Management
  - Service Level Management
  - Service Reporting
  - Information Security Management
  - Budgeting & Accounting for IT Services

  Configuration Management Processes
  - CMDB
  - Change Management
  - Incident Management
  - Problem Management

  Resolution Processes
  - Business Relationship Management
  - Supplier Management
Configuration Management / CMDB

- Configuration Management Database (CMDB) is the central information store/provider for all ITSM-processes
  - Logical model of infrastructure
  - Store information about Configuration Items (CI) + relations between

- Designing and establishment of a CMDB is one of the most challenging undertakings
  - Which information is needed?
  - Which information can be maintained?
  - Where are these information stored now?
  - How can these information be integrated in the CMDB of the selected ITSM tool?
Problem building a CMDB

- Initiating a CMDB is never a „greenfield project“, local data repository’s (MDR) exist already in every company

At the LRZ exist around 90 different information systems

- Enterprise applications
- Wikis
- Monitoring tools
- Documents
- Excel sheet’s
- Home grown applications
Building a federated CMDB

- Not all MDRs make sense
- Good time to sort some less useful data repository’s out
- Single monolithic CMDB is not applicable in larger infrastructures

But which MDR is really obsolete and how can you constitute the claim?

Replace or integrate?
- Replace: MDR data must be imported in the CMDB before switching off
- Integrate: MDR data is kept synchronized with the CMDB
### Setting up a decision matrix for MDRs

#### Evaluation catalog

<table>
<thead>
<tr>
<th>Section</th>
<th>Common Criteria</th>
<th>Functionality</th>
<th>Technology and interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Usage Scope</td>
<td></td>
<td>- Additional functionality</td>
<td>- Database as storage</td>
</tr>
<tr>
<td>- Supplier Support</td>
<td></td>
<td></td>
<td>- Export interface</td>
</tr>
<tr>
<td>- Importance within organisation</td>
<td></td>
<td></td>
<td>- Import interface</td>
</tr>
<tr>
<td>- Complexity of maintenance</td>
<td></td>
<td></td>
<td>- Automatic identification of CI possible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Connection to other systems</td>
</tr>
</tbody>
</table>
Decision matrix for MDRs

- **Evaluation catalog**
<table>
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</tr>
<tr>
<td>Technology and interface</td>
</tr>
</tbody>
</table>

- **Weighted rating matrix**
<table>
<thead>
<tr>
<th>Rating</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>No significance</td>
<td>0</td>
</tr>
<tr>
<td>Minor importance</td>
<td>1</td>
</tr>
<tr>
<td>Important</td>
<td>2</td>
</tr>
<tr>
<td>Very important</td>
<td>4</td>
</tr>
</tbody>
</table>

- **Results in a single integration score**
  - < 50%: replace
  - > 50%: integrate
  (between 40-60% further investigation suggestive)
### Decision matrix for MDRs at the LRZ

**Excerpt of matrix:**

<table>
<thead>
<tr>
<th>Integration/Migration Scoreboard</th>
<th>LRZ Switch Documentation Tool</th>
<th>VMware infrastructure 3.5 Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Criteria (25%)</td>
<td>Communications Department</td>
<td>LRZ wide</td>
</tr>
<tr>
<td>Usage scope</td>
<td>Existent</td>
<td>LRZ wide</td>
</tr>
<tr>
<td>Supplier support</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Importance within organization</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Complexity of maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functionality (25%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional functionality</td>
<td>No</td>
<td>Yes - controlling of VMware</td>
</tr>
<tr>
<td>Technology and Interfaces (50%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database as storage</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Export interface</td>
<td>n.a.</td>
<td>Yes - SOAP</td>
</tr>
<tr>
<td>Automatic identification of CI</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Connected to other systems</td>
<td>No</td>
<td>Yes - Active Directory</td>
</tr>
<tr>
<td>Result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration Score (%)</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Referral</td>
<td>Replacement</td>
<td>Integration</td>
</tr>
</tbody>
</table>
Designing the federated CMDB (information model)

- Design process after identifying all relevant MDRs
- Elicitation workshops with concerned stakeholders
- Top-down approach for CMDB-Design:
  - general master data
  - Elements for core services
  - Informations for selected ITSM-procedures
  - Refining on demand…
Designing the federated CMDB (data model)

- Transform the information model into a data model

- Depends on selected CMDB-Tool
  LRZ uses iET ITSM from iET Solutions® and is now implementing the CMDB-Structure
Conclusion & Outlook

- Monolithic CMDB is not feasible, trend is federated CMDB
- Developed a decision matrix for assessment of MDRs (Replace or integrate)
- CMDB design technique for information model: Top-Down Approach
- Transformation information model into data model
- Implement our concept into our ITSM-Tool (iET ITSM)
- Connect major MDRs to the CMDB of the ITSM-Tool
THANKS FOR YOUR ATTENTION

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