Leibniz Supercomputing Centre
of the Bavarian Academy of Sciences and Humanities

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:

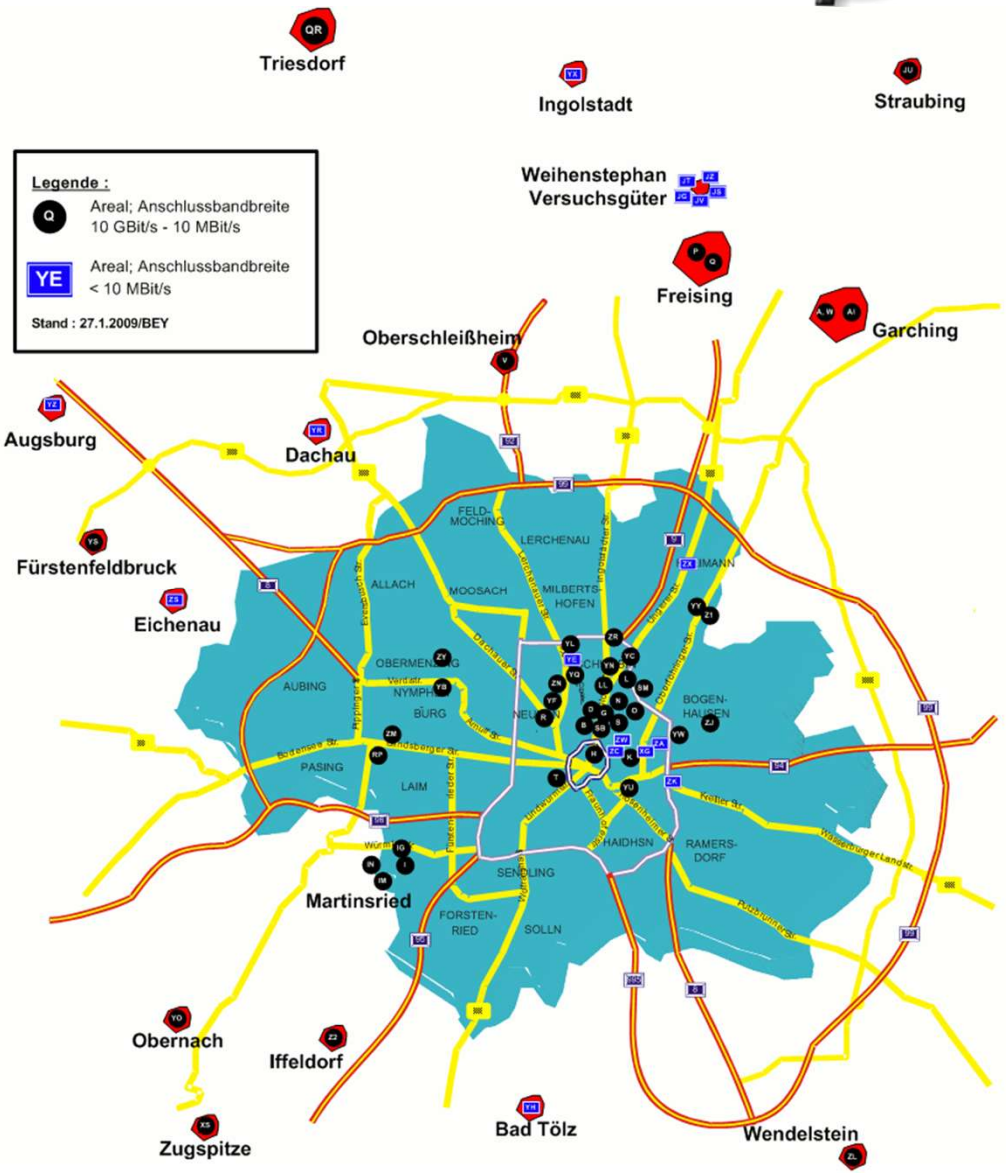
- **Provider of IT Services for scientific and academic institutions in the Munich area (munich scientific network)**
  - more than 80,000 students
  - more than 26,000 employees

- **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

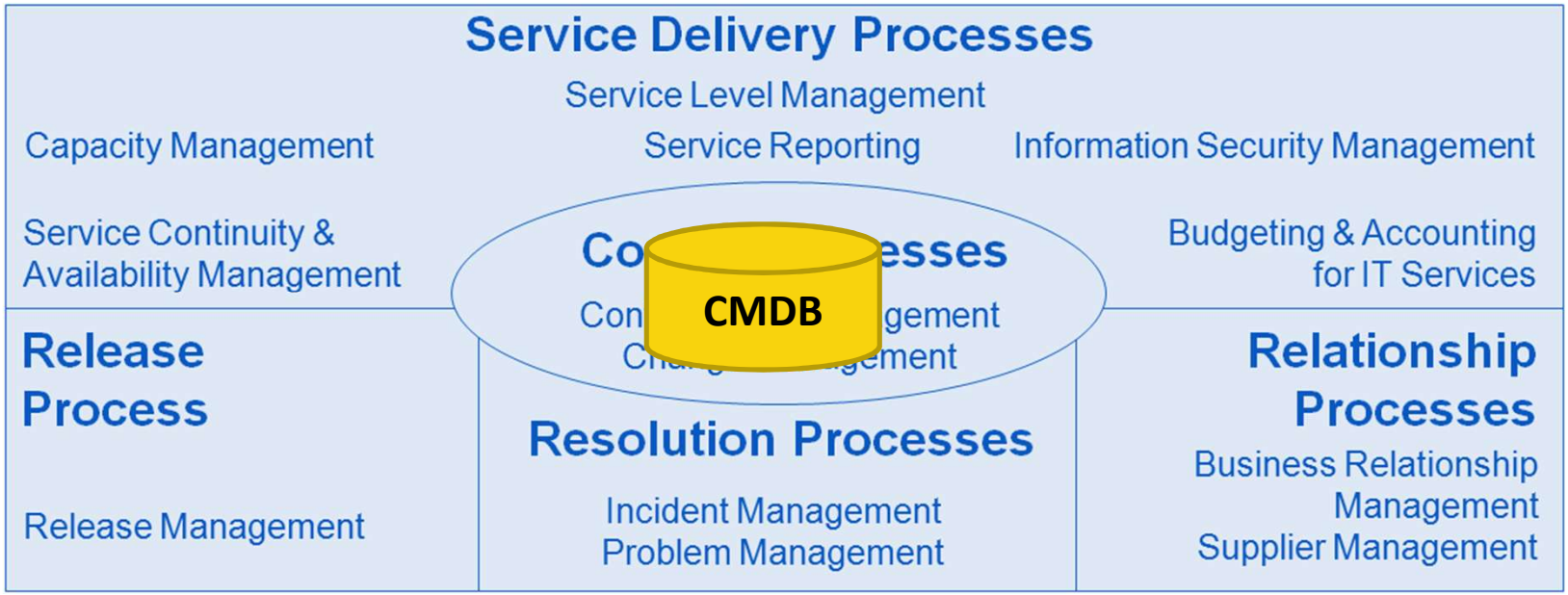
- **Diverse vertical range of service provisioning**
- **Heterogenous service portfolio (continually expanding)**
- **Increasing criticality of services**
- **Increasing scope, volume and complexity of services**

→ **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:**



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**

Section	
Common Criteria	- Usage Scope - Supplier Support - Importance within organisation - Complexity of maintenance
Functionality	- Additional functionality
Technology and interface	- Database as storage - Export interface - Import interface - Automatic identification of CI possible - Connection to other systems

Decision matrix for MDRs

- **Evaluation catalog**

Section
Common Criteria
Functionality
Technology and interface

X

- **Weighted rating matrix**

Rating	Weight
No significance	0
Minor importance	1
Important	2
Very important	4

→ **Results in a single integration score**

< 50%: replace

> 50%: integrate

(between 40-60% futher investigation suggestive)

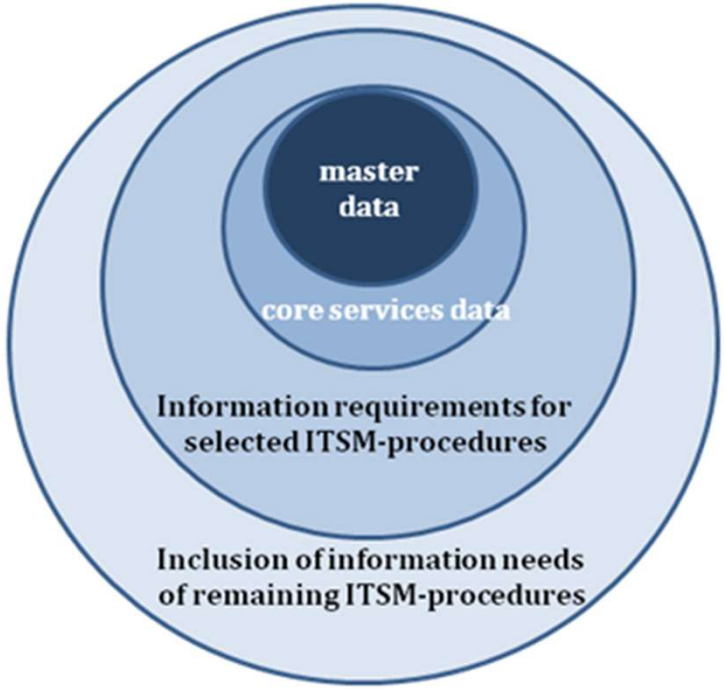
Decision matrix for MDRs at the LRZ

Excerpt of matrix:

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

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…



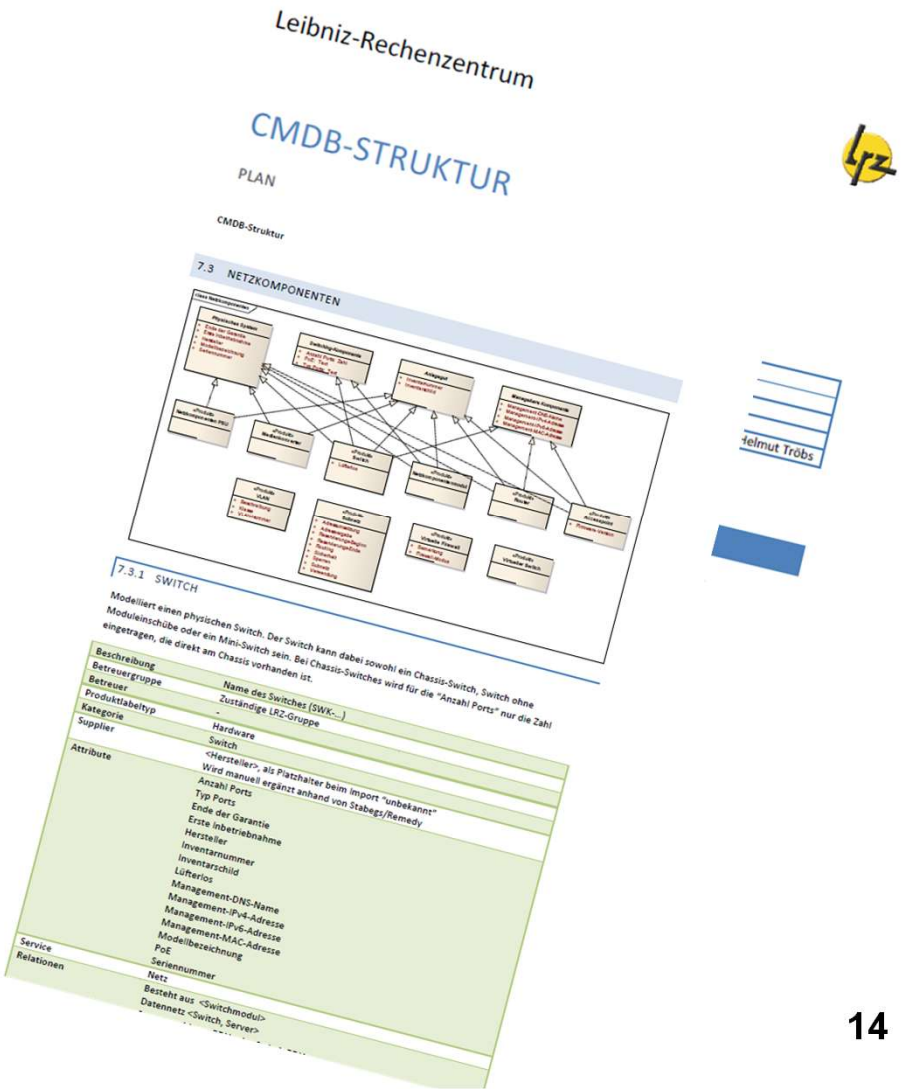
Designing the federated CMDB (data model)

- **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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CMDB-STRUKTUR

PLAN

CMDB-Struktur

7.3 NETZKOMPONENTEN

7.3.1 SWITCH

Modelliert einen physischen Switch. Der Switch kann dabei sowohl ein Chassis-Switch, Switch ohne Moduleinschübe oder ein Mini-Switch sein. Bei Chassis-Switches wird für die "Anzahl Ports" nur die Zahl eingetragen, die direkt am Chassis vorhanden ist.

Beschreibung	Name des Switches (SWK-...)
Betreuergruppe	Zuständige LRZ-Gruppe
Betreuer	-
Produktlabeltyp	Hardware
Kategorie	Switch
Supplier	<Hersteller>, als Platzhalter beim Import "unbekannt"
Attribute	Wird manuell ergänzt anhand von Stabegs/Remedy
	Anzahl Ports
	Typ Ports
	Ende der Garantie
	Erste Inbetriebnahme
	Hersteller
	Inventarnummer
	Inventarschild
	Lüfterlos
	Management-DNS-Name
	Management-IPv4-Adresse
	Management-IPv6-Adresse
	Management-MAC-Adresse
	Modellbezeichnung
	PoE
	Seriennummer
Service	Netz
Relationen	Besteht aus <Switchmodul>
	Datennetz <Switch, Server>

Helmut Tröbs

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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