



Dynamic IT Solutions for Energy Efficient Computing in Data Centers

BITKOM - Bundesverband Informationswirtschaft, Telekommunikation
und neue Medien e.V.

Jürgen Heidegger, Fujitsu Siemens Computers

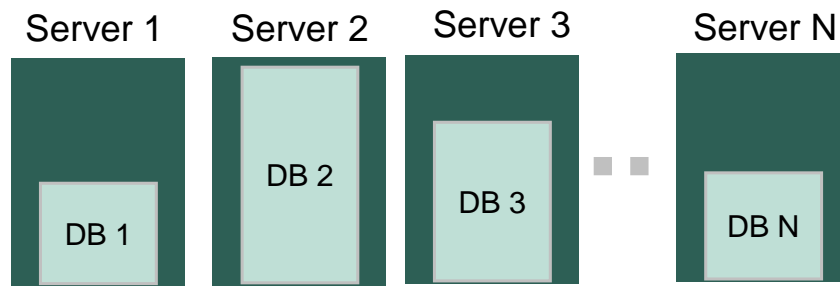
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How to cope with the Green IT Data Center challenges?

- Boost Energy Efficiency in IT Infrastructures
 - Increase use of energy efficient components
 - Reduce consumption through efficient systems
 - Usage of cooling optimized systems
- **Optimize Infrastructures**
 - Consolidation
 - Virtualization
 - Automation
 - **Transition from a static to a dynamic IT environment**
- **Optimize Data Management**
 - **Information Lifecycle Management**
- Boost Energy Efficiency in Cooling Infrastructures
 - Management of cooling airflow in data centers



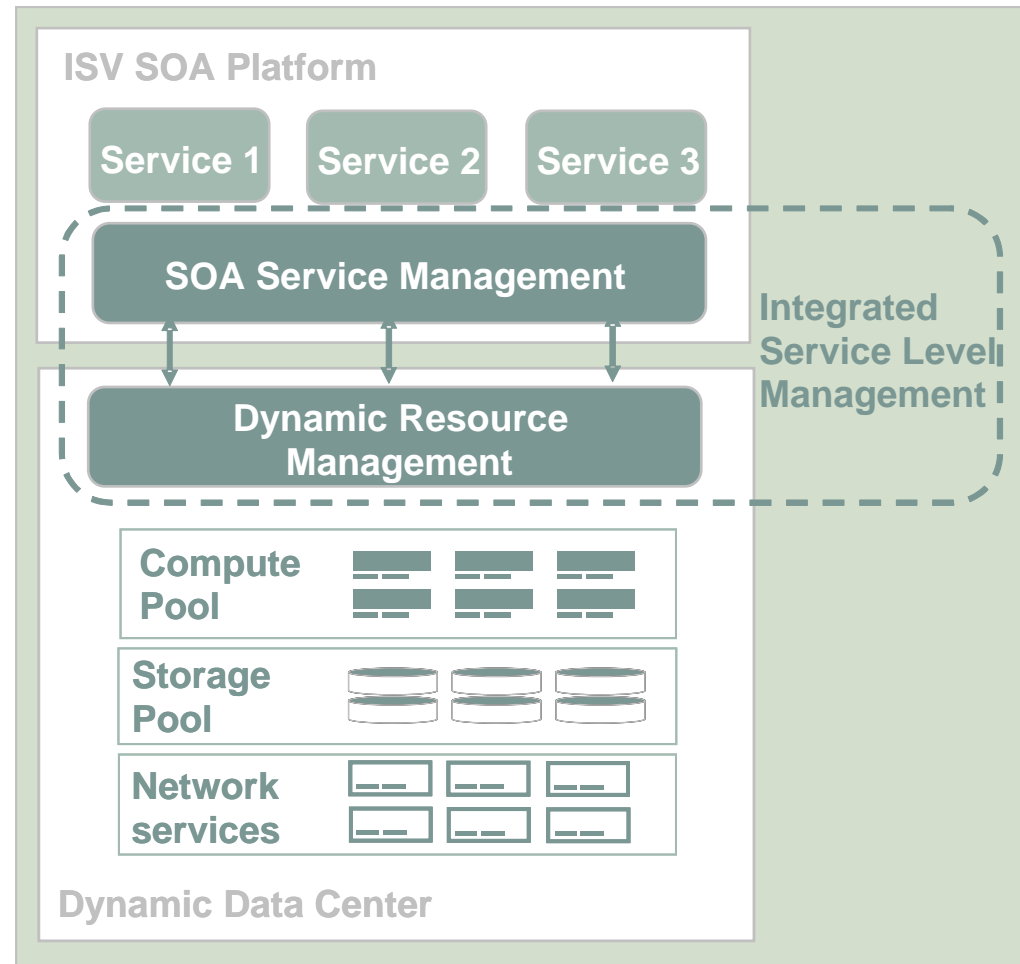
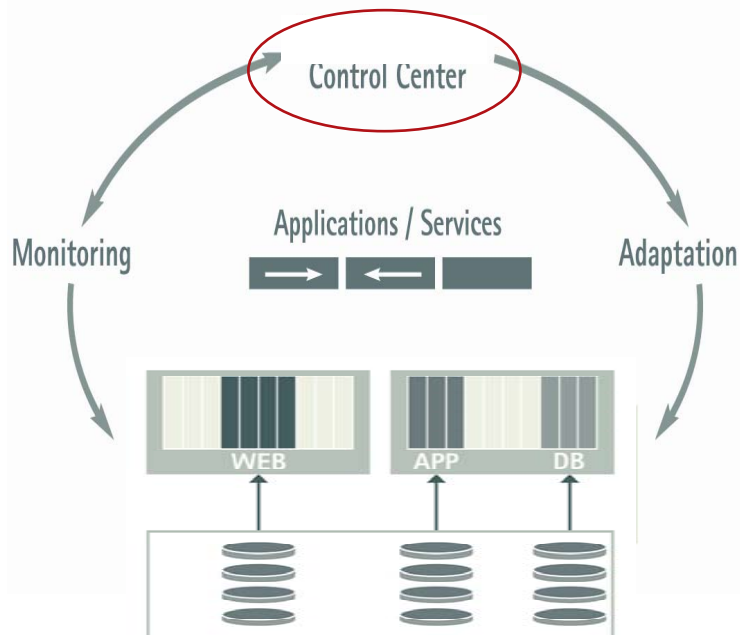
Typical Situation in many Companies – Several (e.g. Database) Systems on Isolated Servers



- High operational costs
 - Individually installing, maintaining and operating each server
- No flexibility regarding workloads
 - Some systems are underutilized, some are at the limit
- High availability would require a spare server for each productive one
- **Energy efficiency not in focus**

Transition from a static to a dynamic IT environment

Service-oriented Infrastructure – energy efficient consumption



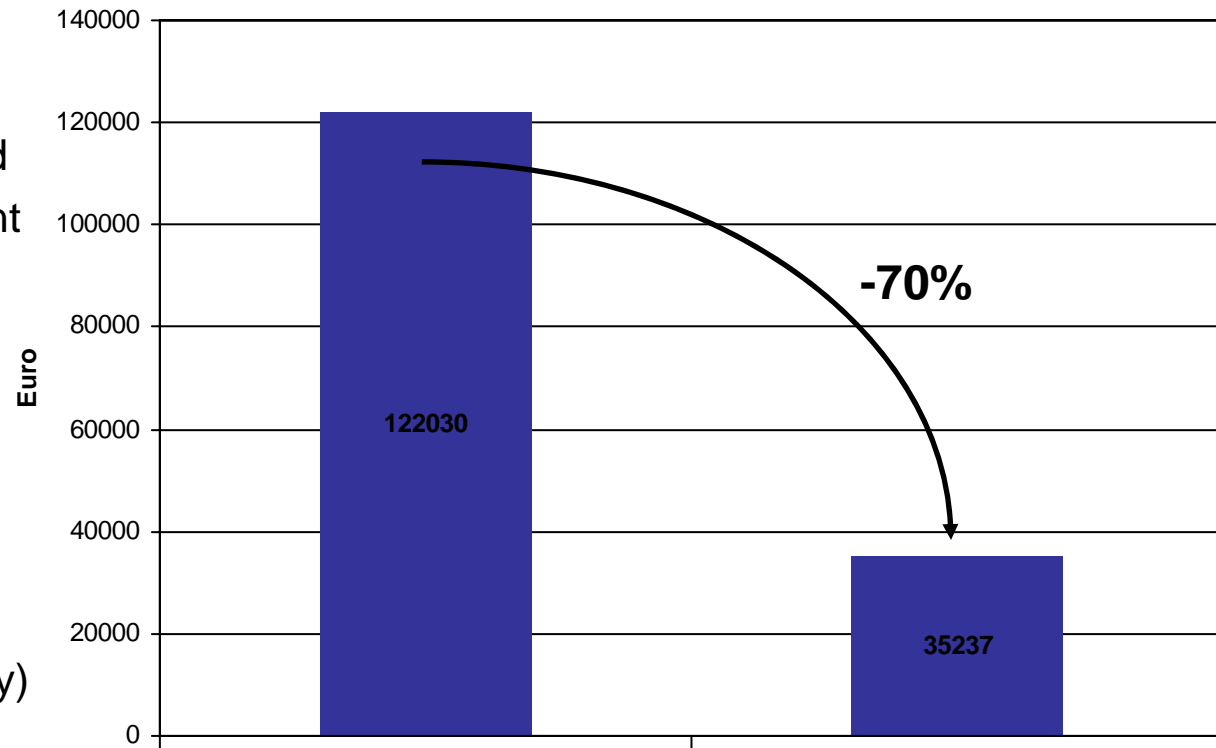
Dynamic Data Center Solutions: Service – oriented Infrastructure for e.g. Oracle / SAP

- Consolidates large database and application landscapes to a decreased pool of industry standard blade servers.
 - > **Reduces power consumption.**
- Manages blade pools for efficient resource utilization.
 - > **Less blades** (resulting in less power / cooling consumption) **for the same load.**
- Power management (server on/off)
 - > **Avoids** energy waste (e.g. **idle mode**)
- Shared storage systems.
 - > **Higher disk utilization supports energy efficiency.**
- Energy reduction up to 70% (project specific).
 - > **Without price premium.**

Flexible Energy Consumption through Dynamic IT Solutions (e.g. SoA for Oracle)

- All Oracle services are managed by the Control Center
- Servers are only switched on / off due to requirement to avoid energy waste (e.g. idle mode)
- Energy efficient N:1 redundancy concept
- Shared storage systems (higher disk utilization supports energy efficiency)

Energy cost savings “SoA for Oracle”
(concrete customer scenario)



A service oriented infrastructure significantly reduces energy consumption

Optimize Data Management

Information Lifecycle Management (ILM)

- Mapping information to storage resources appropriate for its value
 - Mission critical data should be stored on the high performance and secure SAS disks
 - None critical data can be stored on the cheap and power efficient SATA disks
 - Tape is the most energy and cost efficient way to store data



Virtual Tape Library ILM¹⁾ with disk and tape

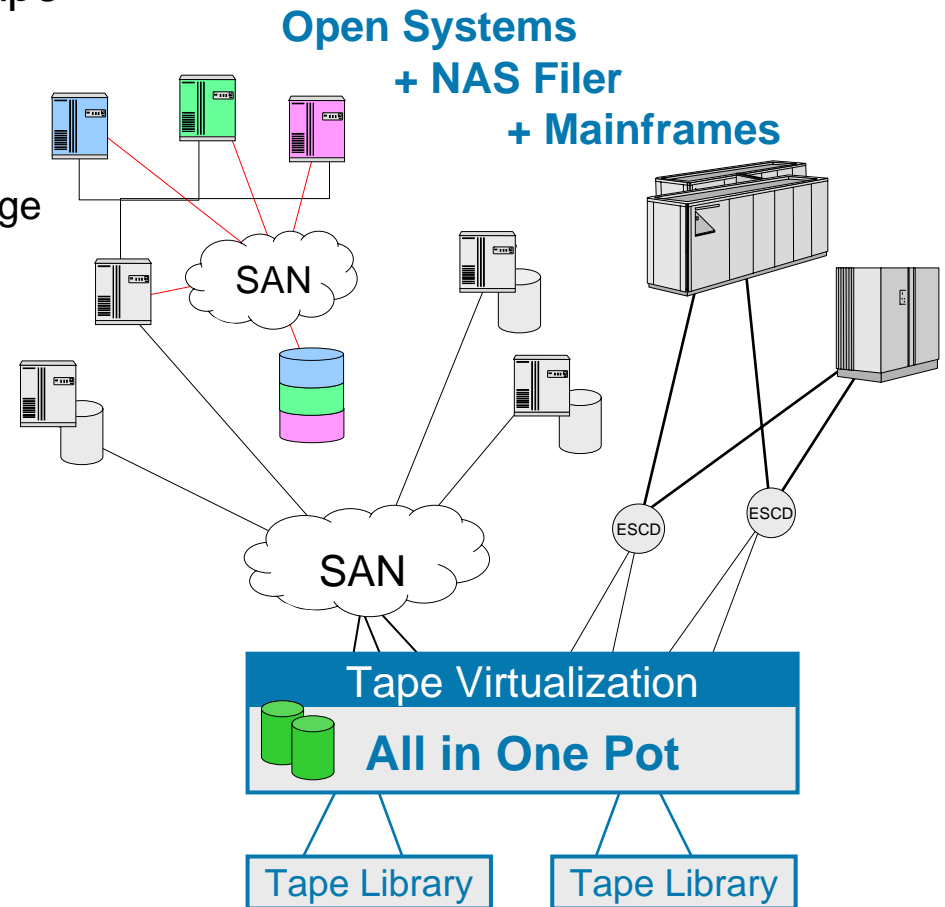
- The most advanced integration of tape

- Consider different values of data
- Optional choose of tape and/or disk
- Always use of the most effective storage media
- Managed tape storage needs less power than comparable disk solutions

- Consolidation reduces

- Total cost of backup storage
- Footprint for backup and archiving
- Power consumption
- Data center climate

¹⁾ ILM = Information Lifecycle Management



Energy efficient storage approach

- Storage consumes ca 15%-20% of data center energy
- Recommendation (three step approach):
 1. Optimize Data Management
 - > Delete obsolete data
 2. Optimize Infrastructure
 - > Consolidate
 - > Apply Information Lifecycle Management
 - > Use tape
 3. Optimize Device
 - > Use state of the art technology



Cost / Benefit of Green IT Activities

