

Zelené dátové centrá a virtualizácia

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SIEMENS



Oxymoron

- Slovné spojenie slov, ktorých význam sa navzájom vylučuje, alebo vytvára logický rozpor
- Príklady
 - Suché slzy
 - Smutný smiech
 - Tichý výkrik
 - Zelené dátové centrá



Dva dôvody na transformáciu dnešných DC:

1

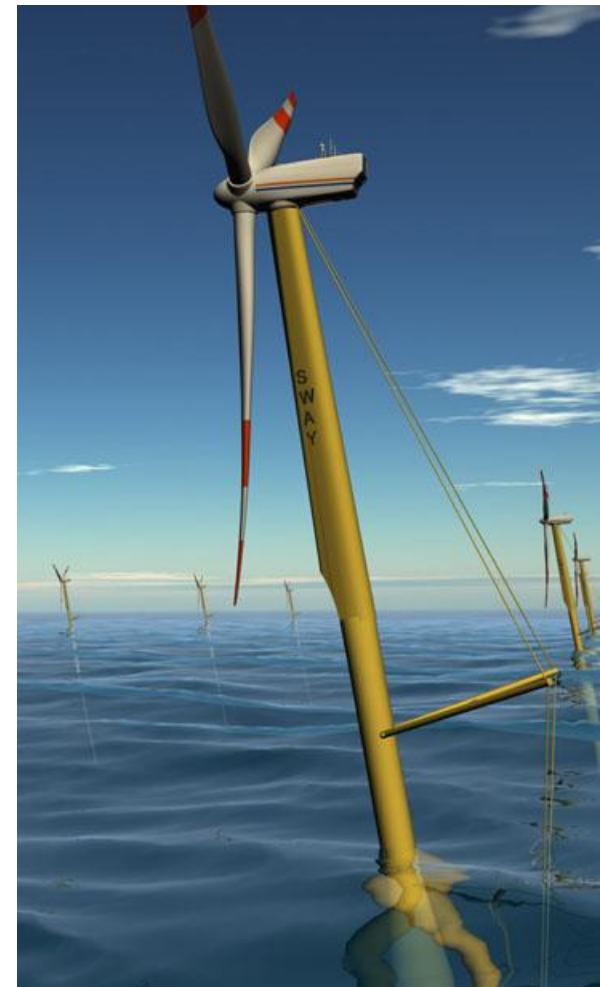
Dátové centrá boli pôvodne navrhované s ohľadom na bezpečnosť a redundanciu – neboli optimalizované z pohľadu energetickej efektívnosti

2

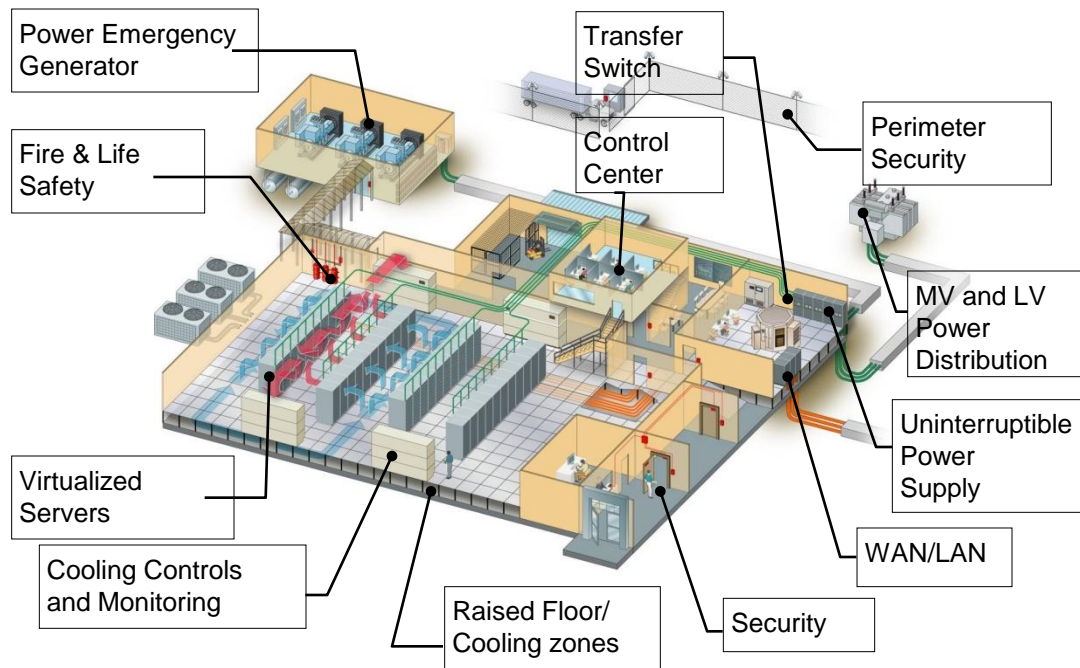
Dátové centrá starnú a spoločnosti neplánovali ich pravidelnú obnovu, z dôvodu vysokej hustoty IT technológií je vhodné preveriť dizajn dátových centier realizovaných už pred štyrmi rokmi

Dnešné výzvy stojace pred DC:

- **Managing Complexity** – Data Center computing environments are multi-tiered, inter-dependent, distributed, highly networked and must be orchestrated with the proper tools and processes for harmonious IT service delivery
- **Energy Efficiency** – initially designed for physical security and redundancy, data centers now require modularity, flexibility, the support of a wide array of IT equipment with improved facility and equipment power and cooling efficiencies
- **Security and Regulatory Compliance** – Business compliance to legislation (HIPAA, SB 1386, GLBA / FFIEC, SOX, FISMA, etc.) and increased corporate focus on IT security guidelines, policies and procedures including audits



Siemens - predpoklady pre úspešné DC:



Expertise provided by

Siemens IT Solutions and Services
Siemens Building Technologies
Siemens Power Distribution

Proven availability through high-level infrastructure

Among SIS data centers operating on *tier 3* (Uptime Institute) are the following:

- Munich, Germany
- Erlangen, Germany
- Paderborn, Germany
- Vienna, Austria
- Neutal, Austria
- Madrid, Spain
- Espoo, Finland
- Nottingham, UK
- Beijing, China

Transformational Data Center (TDC)

Siemens Transformational Data Center (TDC) sa skladá z nasledovných troch kľúčových oblastí:

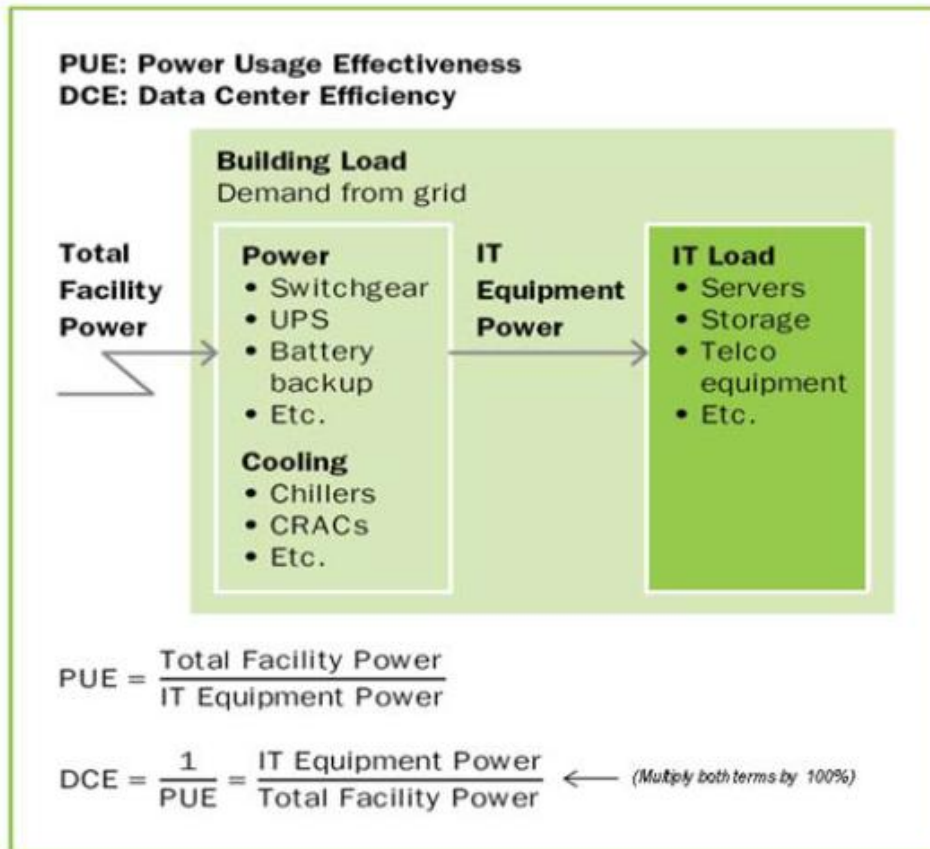
Active Energy Management

Virtualization

IT Automation

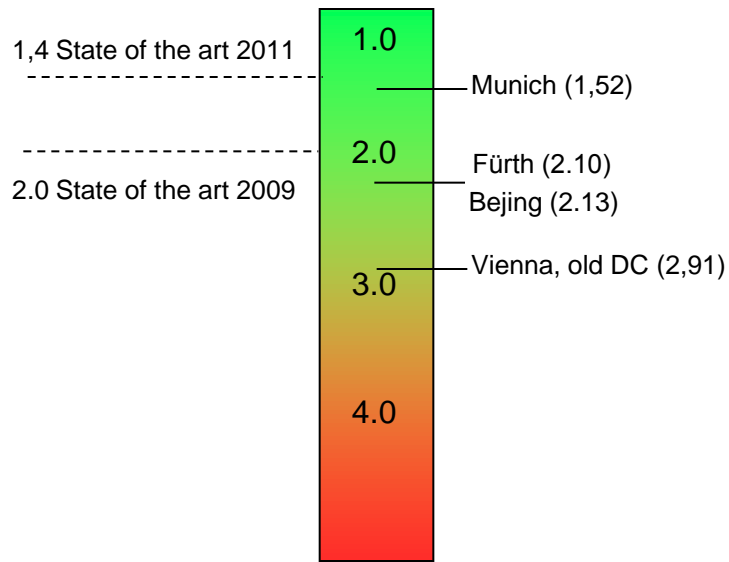


PUE, DCE – trochu teórie:



- PUE measures how much of the total power input to a datacenter actually goes to the IT-equipment!
- Measures the efficiency of DC-design (cooling, ...)
- PUE does NOT measure how energy-efficient the IT-components are (e.g. old servers)
- PUE does NOT measure how efficient the IT-use is (e.g. unused equipment still running)
- PUE neglects embodied energy (7-10%)

PUE – trochu praxe (DC Siemens)



PUE | Power Usage Effectiveness

The PUE ist commonly accepted as an indicator for data center energy efficiency as well as for the achieved level in “green” operation.

A value of 2.0 is today considered to be the actual state of the art.

Example: Data center Perlach, Munich



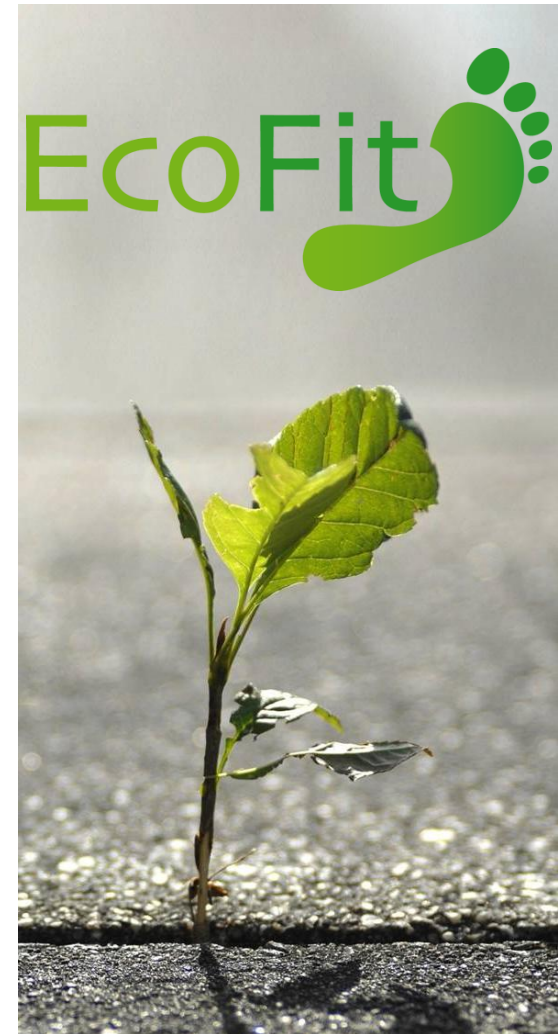
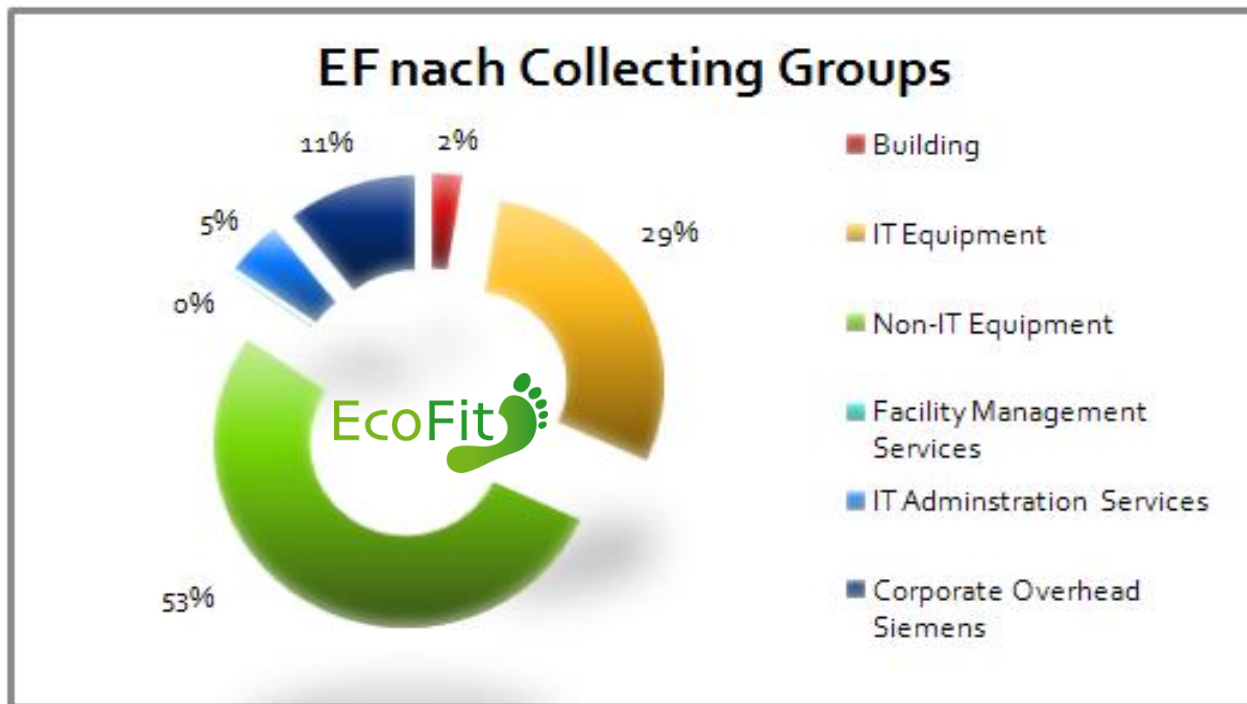
- Water-free data center: All infrastructure components are located outside the server rooms.
- In 2006, diesel generators were installed for better reliability.
- At the site, groundwater can be used for cooling purposes. Due to its low temperature, this leads to more efficient cooling.
- Lost heat from the data center is used for heating. This results in cost reductions and helps to achieve the outstanding PUE of 1.52.

By pushing “green” operation, Siemens not only shows ecologic responsibility, but at the same time lowers operational costs to the minimum.

EcoFit – pohľad za hranice teórie

EcoFit - Ecological Footprint for IT

Result of the EcoFit datacenter-casestudy by collecting groups



Siemens – Global Production Centers:

Approx 1400 employees worldwide deliver data center services out of our dedicated global production centers. 50 % of our data centers in Western Europe are served remotely.

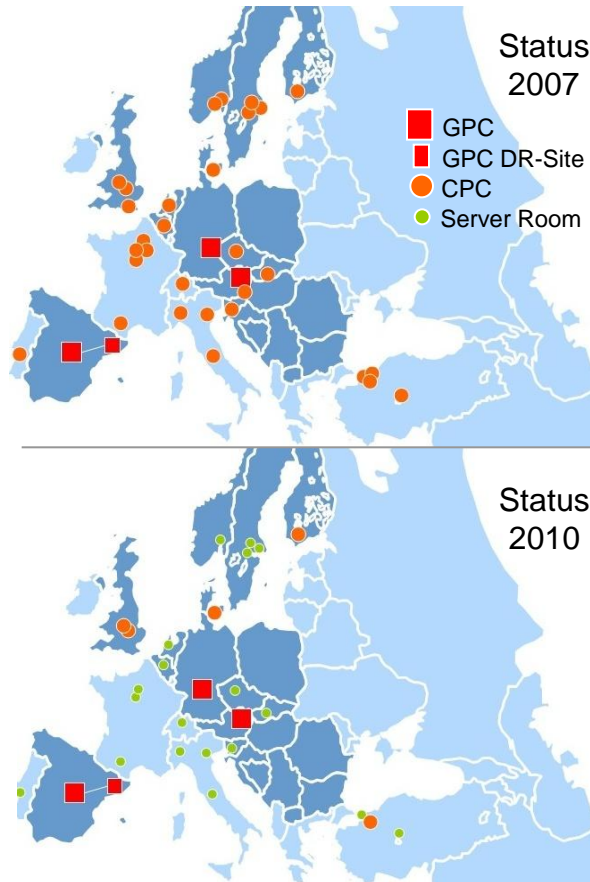


Figures for Western Europe	
674	Mio. € DCO Revenue in FY 2008
3	Global Production Centers
24	Local Production Centers
19,200	Servers
26,000	Square meters
11	Petabyte online storage
560	Exchange servers
575,000	Mail users supported
870	Staff
360	Customers

Siemens – konsolidácia DC v Európe

Example:

Data center locations in EMEA



Physical consolidation not only saves floor space, but is an opportunity for simplifying the IT landscape

Transformation pushes hardware modernization, which results in increased energy efficiency.

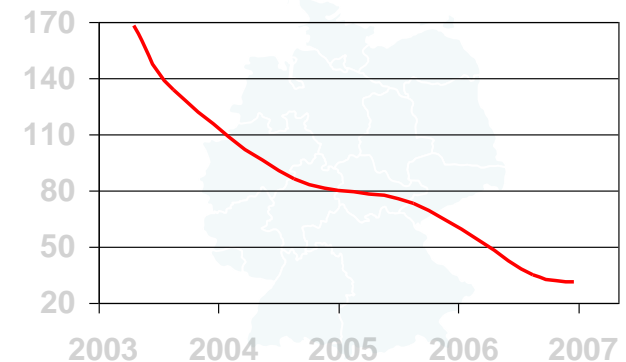
Relocated and new servers feature exclusively new technology like virtualization and related tools.

Applications can be updated to current releases. This simplifies Patch and Incident Management and minimizes the number of needed service contracts

Transformation can decrease the number of different operating systems and applications in use.

Example:

Number of data centers and server rooms in Germany

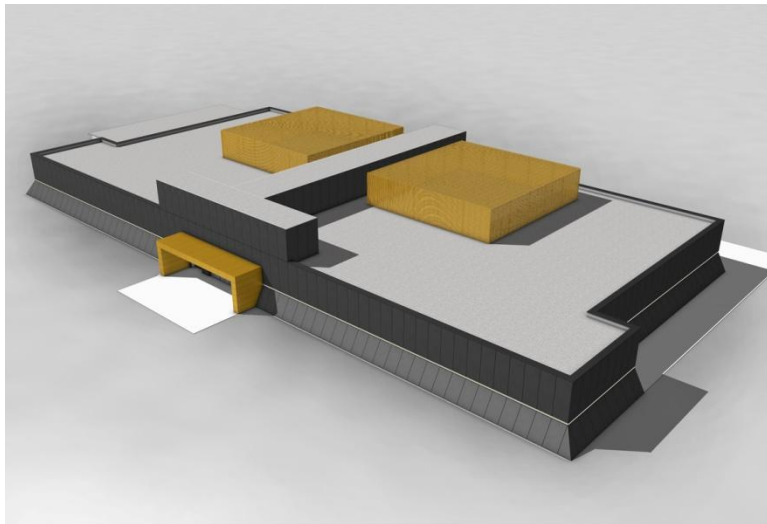


80 % reduction in 4 years

Even though the overall capacity has soared, the number of locations has been sharply reduced.

- Relocation of on-site delivered services to SIS data centers, where possible.
- Centering of services for the Siemens group to the GPC Munich/Fürth

Siemens – nové DC vo Viedni (Q1 2010)



SIEMENS - RECHENZENTRUM 1

ATELIER KUTSCHERA WIEN



FUNKTION: ARCHITEKTUR: KOSTEN: TERMINE

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Siemens – nové DC vo Viedni (Q1 2010)

Technical concept

- Highest availability: Tier 3+
- All maintenance and extensions can be performed possible within running operations
- Scalable concept for efficient power and cooling usage
- High density and traditional utility space
- RFID Lifecycle Management

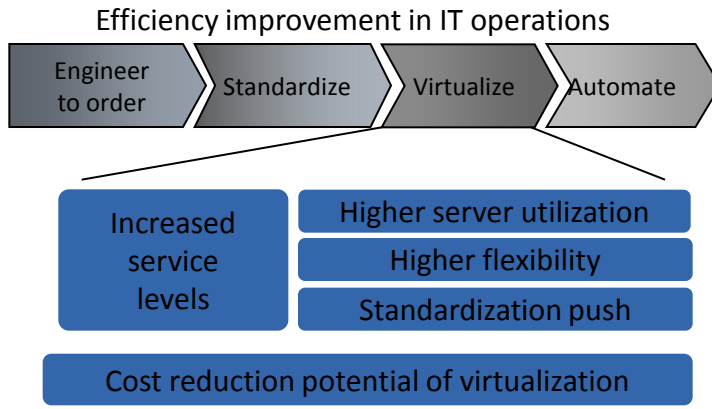
Energy and cooling

- Universal fully redundant power supply systems with UPS, emergency power generators and redundant A+B power supply
- Full redundant cooling system with optimized energy efficiency incl. free cooling
- DC-layout strictly following cold-/warm corridor principle for optimal energy efficiency

Security

- State of the art security systems:
 - biometric access control
 - room-specific access
- Tiered security concept
- Entrance to server rooms only through security locks
- Video surveillance
- security control center
- Surveillance time: 7x24
- Central location within Siemens City
- Automated control and monitoring
- fire areas with high sensible smoke- and fire detection
- Automated fire extinguishing system
- Two separated rooms for data network entry
- Multiple, different network carriers

Siemens – virtualizácia interná prioritá



Capital Expanse Savings

- Reduced amount of servers
- Reduction of capital commitment
- Reduction of capital cost
- Physical consolidation, reduced floor space
- Cost reduction for infrastructure and operations

Operational Expanse Savings

- Improved flexibility
- Reduced human resources
- Complexity reduction of operations processes
- Reduced maintenance costs

Siemens IT Solutions and Services strongly pushes virtualization, with the goal of 70% virtualized servers ratio in view.

Example: Cooperation with

VMWare vSphere 4, general availability April 2009, is already set as the standard virtualization tool for Siemens data centers.

Siemens is a member of the VMware vCloud initiative (cloud-based service delivery push).

In August 2009, Siemens and VMware have concluded a partnership agreement, in order to develop new virtualization-based offers and implement a common marketing and sales strategy.

SITS Innovation Radar™ - najbližšie trendy



Sumár – čo je dnes efektívne DC?

- Right-sized datacenter and IT-capacities, with optimum load, modular expansion possibilities
- PUE about 1,5 to be improved
- Optimized Design Cold / Hot Corridor layout, Airflow management
- Optimized Cooling, depending on local situation e.g.
 - Free Cooling
 - CO₂-Cooling (if legislation permits, see Sweden and Austria!)
 - Groundwater
- High-Density, low consumption IT-equipment
- Life-Cycle managed, all equipment hat optimum life-cycles
- Measure, don't estimate energy consumption, optimize power management
- Use green electricity
- Most important: reduce energy consumption, improve constantly with AEM

Ďakujeme za pozornost

SIEMENS

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Komentár pred panelovou diskusiou

Čo si o efektívite DC myslia naši top infraštruktúrni architekti?

SDA1 (prezývka - anarchista):

- Vypínať, vyhadzovať

SDA2 (prezývka - najmúdrejší):

- Upratovať