GEYSER
Green Networked Data Centres as Energy Prosumers in Smart City Environments

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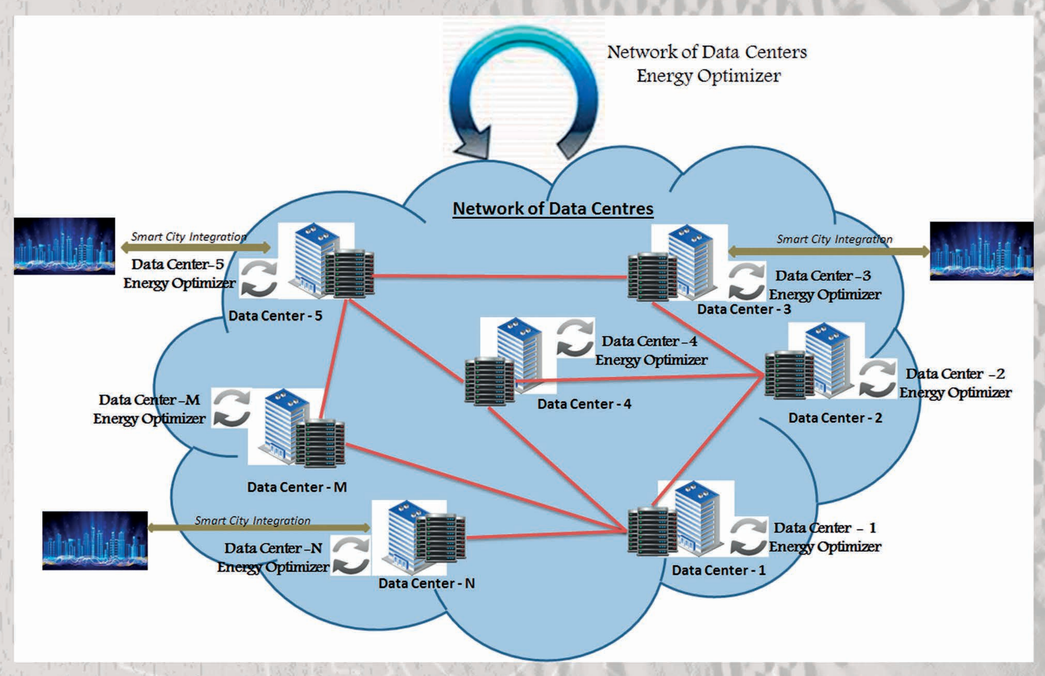
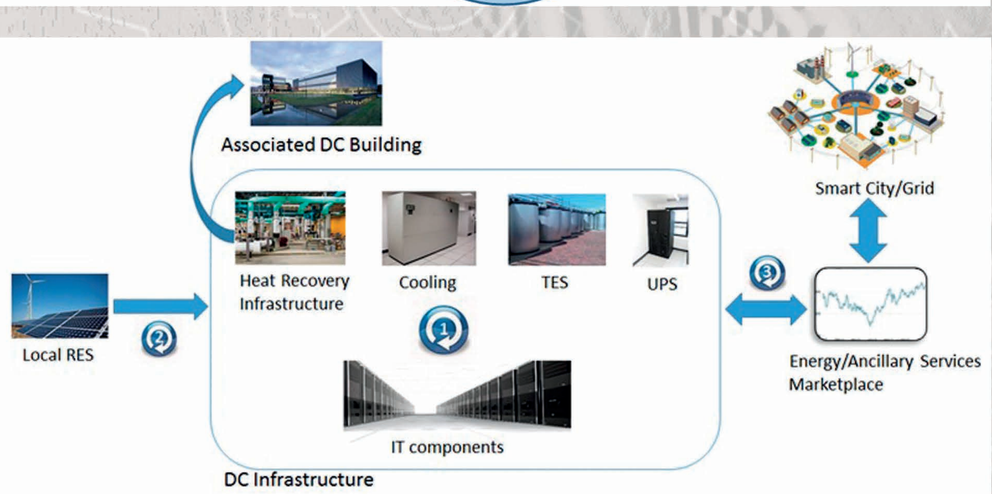
Objectives

GEYSER project objective is to design, implement and validate a technological and conceptual framework for green energy-sustainable networked Data Centres acting as Energy Prosumers within a Smart City / Smart Grid integration paradigm. GEYSER research spans over both optimized design and operational management of next generation Data Centres located in smart city environments.





- ✓ Main addressed optimization problems
  1. Energy consumption optimization to generate flexible energy loads
  2. Maximize the usage of locally produced renewable energy
  3. Optimize the interaction of the data center with the smart grid

Description

The GEYSER project aims to step well beyond today's "Green Data Centres" self-sustainability efforts by researching on and delivering an innovative conceptual and software framework aimed at improving and trading-off energy efficiency and carbon reduction footprint in Data Centres against a broader system-level smart district/smart city energy efficiency, while maximizing the usage of available renewable energy sources.
In order to implement this new yet disruptive concept the GEYSER project will originally combine real time smart synergistic IT infrastructure and cooling monitoring and control, with flexible energy demand and supply management within green energy-driven marketplaces and geographical green supply-aware load balancing for networked Data Centres.

http://www.geyser-project.eu

Outcomes

Techniques and methodologies for:

- Increasing the energy efficiency of Data Centres
- Using as much as possible renewable energy for Data Centre operation thus decreasing the CO2 environmental footprint
- Planning Data Centre operation so they can actively participate in demand / response energy programs
- Relocating workload among partner Data Centres using the "follow the sun" (for renewable energy) or "follow the moon" (for smallest price) paradigms
- Energy budget prediction to determine future energy consumption/ production trends both at the Data Centre and smart city levels
- Continuous and on demand multi-criteria closed control optimization loops based on hybrid evolutionary methods that combine the strength elements of different bio-inspired meta-heuristics
- Representation models and automatic negotiation techniques for SLA to increase the greenness level of the Data Center