

Money in the cloud

Cloud solution for DH leads to cost-efficiency



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Cooperation between mostly Danish partners, aiming at the next generation digitally supported district heating, is described in Hot Cool 2020 no.1.

This article looks at new components in the cloud, performing a useful DH tool in the HEATman concept.

A research platform called "Science Cloud for CITIES" is applied - but not in the commercial version. All are open source, giving considerable freedom to design. HEATman plans to develop a commercial counterpart for the Science Cloud.

This article shows the first insights into the "Commercial Cloud," one of the centerpieces of HEATman. The solution is developed by the Danish company NorthQ based on existing infrastructure monitoring and supporting buildings - primarily giving value to building-fleet owners.

Commercial cloud solution

As a central partner in the HEATman project, NorthQ handles the cloud platform and enables partners to exchange data, insights, and control options. The example image below describes the communication complexity of the commercial cloud concept.

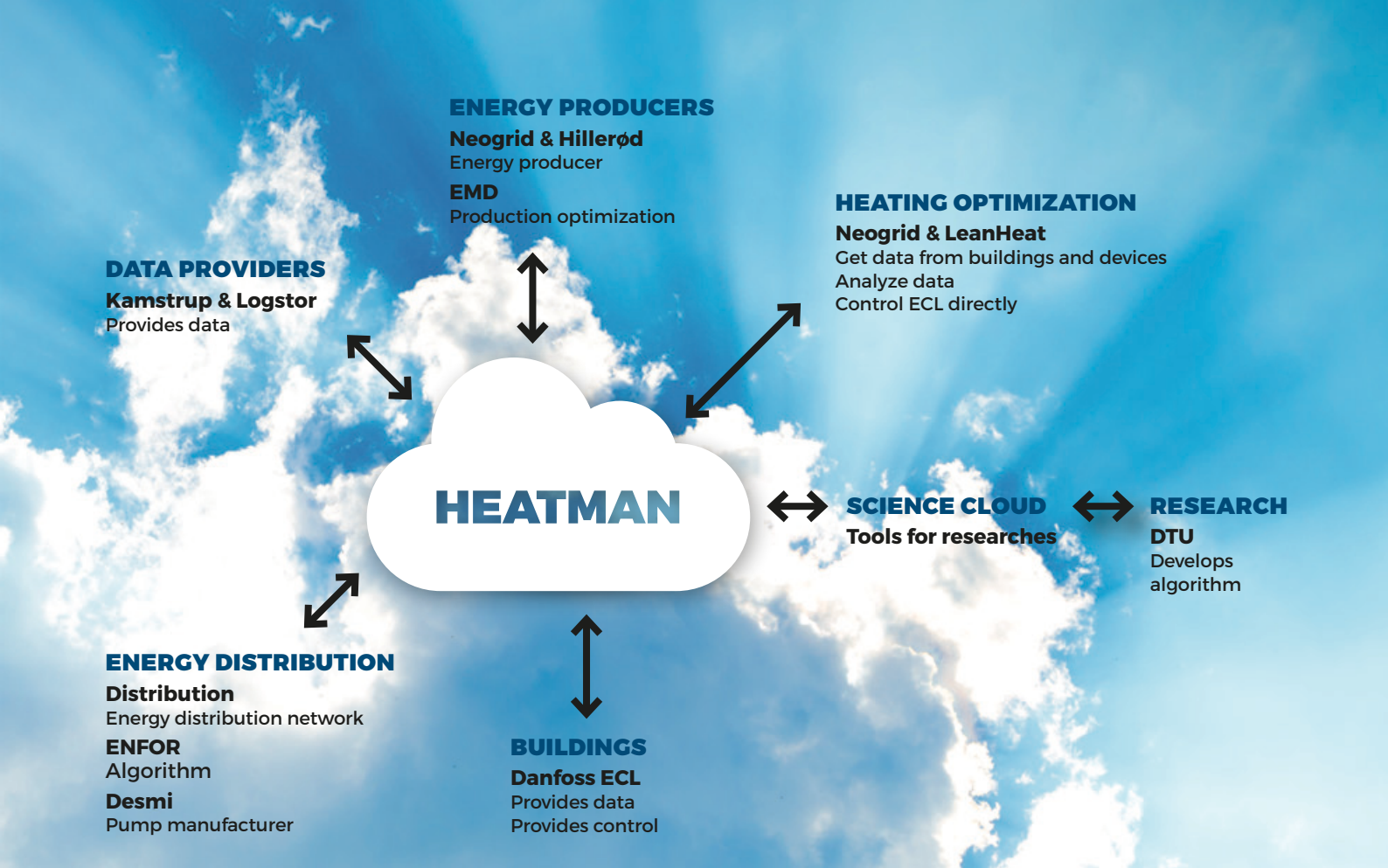
Scalability and security are pivotal. All considered apps and algorithms are secure, scalable, and easy to integrate - making district heating better, more cost-effective, and more efficient for users and utilities.

Here are some of the commercial cloud features the HEATman project will offer to district heating utilities and building owners in the future:

- Data to be collected to an easily accessible central cloud platform.
- Data owners can delegate third-party data access comfortably - from one central platform.
- Cloud platform with inbuilt data standardization of different types of consumption data, inlet/outlet temperature, weather data etc., which are easily collected through API.
- Display and access data through the user-friendly Microsoft PowerBI visualization tool and API for automation.
- Building owner can grant access to a district heating company to take control of a building, for demand side flexibility.
- New data ingestion sources which will enable other HEATman partners to get hold of more data in order to deliver better analytics, insights and visualizations.
- Danfoss heat controller (ECL) integration will allow 3rd parties (Building/Data Owner) to delegate access to data and control.

Security and GDPR

Cybersecurity and compliance with privacy regulations are pivotal for all platforms like HEATman. According to security by design principles, all the user data processed is stored separately from consumption data and device data. Storing the data anonymized strengthens security measures, making it possible only for authorized personnel to match user information such as names, emails, and usernames with their exact consumption information. End-to-end encryption starting from users, leading to the data collection devices. Credentials, security, and encryption keys are unique and single-use, and every device has a security protocol.



Meeting the requirements that the GDPR lays on digital actors is demanding. Still, the microservice-based cloud architecture offers district heating plants, operating personnel of buildings, and energy managers full control of their building data, thus fully complying with the GDPR rules and regulations. Thanks to a decoupling of the user and device data, end-to-end encryptions, and redundancy by design, HEATman makes sure that data and users' private information is safe. As a straightforward example data stream, automated by the platform, has a well-defined end date. A specific procedure executes the processes demanded by the GDPR compliance, e.g., stopping data-delivery, erasing data, etc.

Future developments

Here are some of the future features that will be developed and integrated exclusively for the HEATman commercial cloud platform project:

- Advanced data cleaning functions.
- Data management functions (gives you opportunity to delegate special rights to access data).
- Further heat unit control functions.
- Integration of pump control solutions (for accurate heating measurement, analysis, control).
- Integration with various HEATman project partners.

A smart digital solution supporting the DH sector

The HEATman project has one main goal: to develop a digital solution that will transform the way District Heating and Cooling companies handle data to deliver energy services. NorthQ will continue to develop this idea until February 2022, when the project is expected to be successfully completed, where a robust business model is expected for the overall HEATman consortium.

The need for sustainable solutions on a large scale has never been so pressing, and finding viable economic and environmental answers is key to transforming the district heating sector into an industry driven by efficiency and innovative technologies.

About HEATMAN

The HEATman project was born from the necessity of digitalizing the district heating industry. The project consists of both private and public organizations that have joined efforts in order to optimize district heating operations through the use of data on a large nation-wide scale.

To reach the goal of lowering district heating operational expenses and consumption by a minimum of 2%, Danish utility companies have combined forces with NorthQ and other leading IT companies and universities. The key to success is collecting, visualizing, and analyzing the vast amount of consumption data in an organized manner that drives value across the whole district heating ecosystem. Afterwards, sending control signals will allow for improved operational efficiency where utilities can react fast to weather and consumption patterns.

Updating this old heating system will be a massive step towards Denmark's desire to drastically lower CO₂ emissions and be as sustainable and efficient as possible when using its energy resources. NIRAS, which is the leading part of the project, recognizes enormous possibilities to provide end-to-end solutions to their district heating customers both inside and outside Denmark - in the rest of the Nordic and Baltic regions.



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