

Purdue Projects and Weekly Assignments – Level 2

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Power distribution, cooling systems, fire detection and suppression, physical security, environmental monitoring, and equipment monitoring are all processes that take place in a data center. According to streamdatacenters, the average enterprise data center costs between \$10 million and \$12 million per megawatt to build and \$10 to \$25 million to operate. SCADA processes help data centers increase their efficiency and automate repetitive work.

It is crucial to monitor environmental conditions in data halls. SCADA can monitor and manage cooling equipment such as chillers, air conditioning units, fans, and water pumps.

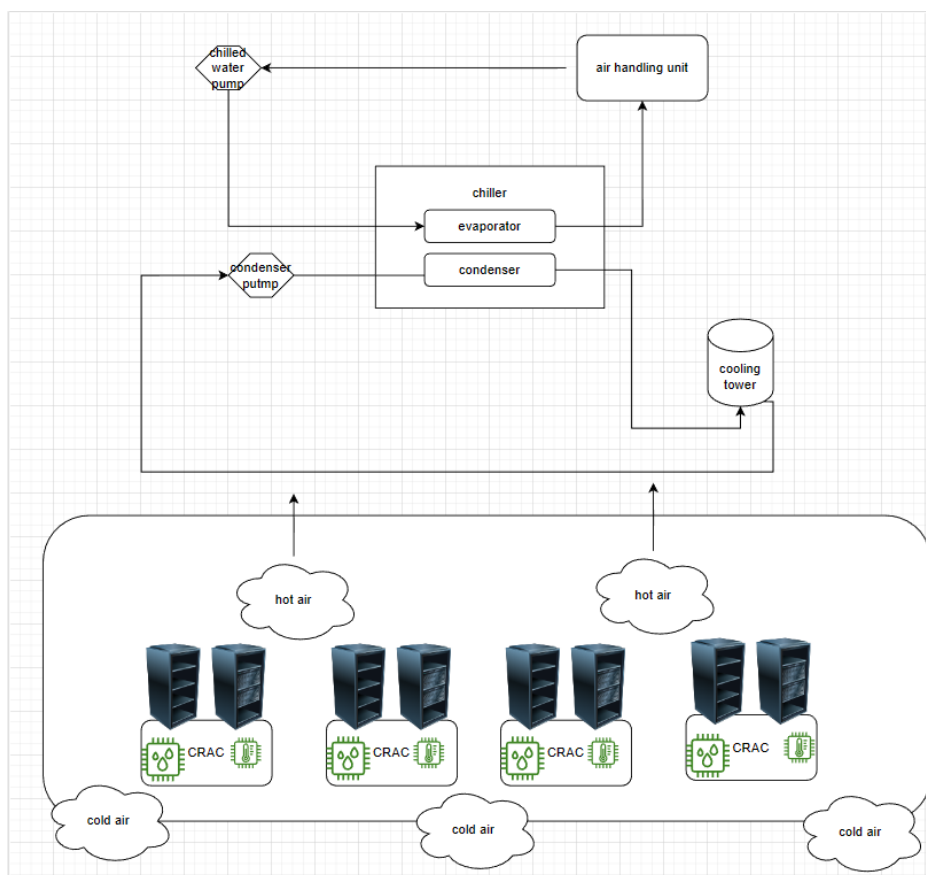
Chillers are large cooling units that remove heat by circulating chilled water. Temperature settings and flow rates can be measured by sensors and later used by the SCADA system to make decisions with PLCs and actuators by controlling valves, pumps, and fans.

Environmental sensors are implemented throughout a data hall to monitor and manage the performance of cooling equipment, optimize energy use, ensure proper airflow, and alert personnel when events take place.

HMIs are used throughout a datacenter to provide operators with a user-friendly interface to monitor, manage, and control data center infrastructure. Data centers require precise control of environmental conditions to ensure optimal performance and equipment reliability. HMIs enable operators to monitor temperature and efficiency. They can adjust parameters in cooling systems such as airflow and humidity levels.

One popular vendor for both data center cooling hardware and software is Schneider Electric. EcoStruxure by Schneider Electric is a comprehensive solution that helps optimize the

performance and efficiency of data center production and reliability. It provides centralized management, predictive analytics, integration, and security and resilience. It is an open platform that can integrate with existing systems, supporting a wide range of protocols and standards. EcoStruxure can provide insights into energy consumption patterns and identify energy saving opportunities. It allows for precise control of cooling systems, serving as an HMI for operators. It is important to realize EcoStruxure is not limited to data center cooling systems but serves as a great product to monitor and control cooling systems along with energy consumption and IT systems.



Reference

- Chhabra, A. (2019, May 29). *The Relation between IIOT, SCADA and HMI Explained*. Schneider Electric Blog. <https://blog.se.com/industry/machine-and-process-management/2019/05/28/the-relation-between-iiot-scada-and-hmi-explained/>
- Dewangan, L., Pathak, A., Ojha, D., Pal, S., Sahu, B., & Singh, S. (2017). *Temperature Sensor Using SCADA*. <https://www.ijraset.com/files/serve.php?FID=7835#:~:text=using%20SCADA%20is%20to%20sense>
- EcoStruxure Platform. (n.d.). [Www.se.com](http://www.se.com).
<https://www.se.com/ww/en/work/campaign/innovation/platform.jsp>
- “SCADA in the Data Center.” *Manufacturing.net*, 21 Apr. 2017, www.manufacturing.net/software/article/13226710/scada-in-the-data-center. Accessed 24 June 2023.
- Puccio, Kris. “A Guide to Your Data Center Controls SCADA, PLC, DCS & More.” *Therma*, 11 Jan. 2021, www.therma.com/plc-scada-los-angeles/.