



**WE'RE DRIVING  
THE NEXT PHASE OF THE INTERNET OF THINGS  
NOW...**

## Strategies for Connected HVAC Control

### Increasing Global Demand

Global demand for Heating, Ventilation and Air Conditioning (HVAC) equipment is forecasted to rise 5.7% annually to \$120 billion in 2018. Across the world, there are different demands for various HVAC equipment. For example, in the United States, there is a high demand for controlling heating and air conditioning equipment (thermostats), while in developing countries such as China, there is an increasing interest in air quality monitors, mainly fueled by the rising number of people suffering from respiratory diseases.

This increasing demand for HVAC equipment brings increasing demand for efficient and effective control. HVAC accounts for nearly 40% of the electricity used in commercial buildings so improved control will provide significant reduction in energy usage, cutting unnecessary costs and increasing return on investment.

### The Challenge with Today's Systems

A recent ClimateProgress report estimates that if buildings in Boston turned up their thermostat by one degree in the summer and down one degree in the winter, these buildings would be able to save over \$20 million in energy each year and cut CO<sub>2</sub> emissions by 81,017 metric tons. With such large benefits, home and business owners can easily cut down their costs, increase their revenues and contribute to a more environmental-friendly community. The challenge is that most systems are manually controlled, or only have basic automation to control based off time of day or temperature set point.

### A Better Way

Connecting these systems to the internet offers a host of new opportunities to not only improve the efficiency of the devices themselves, saving money, but also to improve the customer experience. With Cloud based HVAC controls, the system can automatically adjust the temperature when the rooms are idle, saving more than \$20 million in energy per year. With these benefits, it is estimated that the market for Wi-Fi based thermostats will grow to \$1.4 Billion by 2020.

Cloud connectivity of HVAC systems supports user control from multiple locations, ranging from campus management offices to international offices. Cloud connectivity can embed third party data and services allowing for increased utility. For example, weather service (*ex. weather.com*) information can be integrated to help predict weather impacts for daily planning, and increase lead time for demand response events. This provides the ability to adjust the building to alleviate

### Benefits

- Supports integration to cloud-based energy demand management and demand response systems to improve operational efficiency
- Rules-based operation enables users to define how and when they want HVAC systems to operate to best suit their needs
- Flexible platform and pre-integrated with networking hardware reduces time to market for HVAC solutions

occupant discomfort and utilize historical data on response to weather patterns to allow efficient temperature and humidity control through complex cycles. Using specific historical response data can eliminate lagging responses that cause frustration and inconveniences. At the same time, cloud connectivity allows storing actual usage data to record room temperature before, during and after use to automatically determine areas for optimization. Efficiency is improved as energy usage can be minimized, visibility is increased as occupancy and use can all be monitored, and usability is enhanced as there are greater control factors. Data collected can also be optimized to estimate future occupancy, control and energy usage to further help with granular reporting and visualization of use. With such data, cloud connectivity can integrate occupant tools for preparing rooms in advance, for example, Outlook calendar room booking, to simplify administrative processes.

## IoT Connected HVAC through Ayla Networks

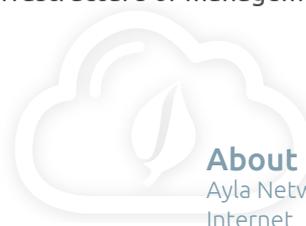
Ayla's Cloud platform overcomes the challenges faced by HVAC product and system manufacturers. The system allows integration of various technology products: sensors, thermostats, heating, air conditioning equipment, for example, and the ability to integrate them all to simplify control. The platform is agnostic to connection technology and can, for example, support WiFi, BT, BTLE, ZigBee, Zwave, cellular and proprietary sub-GHz protocols and wired connectivity. The platform virtualizes all system devices, allowing for efficient management of update and operation. Data stored in the cloud and the platform additionally supports integration of external data and control feeds to forecast best operation and learns from history. For example, feeds can be taken from cloud-based demand management and weather sources to drive environment cycle for the next day based on previous weather and seasonal building responses. Dashboards and reporting offer various role-based display options for building, facility and head office management. Actual "on the ground" control and monitoring via rich mobile apps is facilitated by an API library. This provides a complete platform for the development of a secured, state of the art end to end cloud based system.

Our platform works with "Black Box" pre-configured hardware communications modules from market leading vendors that provide manufacturers with a networking and enterprise grade security solution for their end devices. Our user-friendly system can be designed without complex SDKs and purpose built compilers, but provides outstanding security, data storage, analytics capabilities, cloud processing and user app capabilities. Ayla enables the HVAC Company to concentrate on defining and implementing the product operation, without having to worry about the Cloud connection, infrastructure or management.

## Ayla Networks

607 W. California Ave  
Sunnyvale, CA 94086  
USA

Tel 408 830-9844  
Fax 408 716-2621  
marketing@aylanetworks.com  
www.aylanetworks.com



### About Us

Ayla Networks is a leader in software and solutions that enable the Internet of Everything. Based on the premise that any device should be accessible from any location, the company has developed an end-to-end platform that allows any device to be managed remotely. Headquartered in Sunnyvale, Calif., the company has partnered with major electronics manufacturers, leading venture capital firms and investors who share this vision.

For more information, contact Ayla Networks at [www.aylanetworks.com](http://www.aylanetworks.com).

### References:

World HVAC Equipment Demand to Reach \$120 Billion."

*Appliance Design*. 13 Mar. 2014  
Web. 8 Dec. 2014

70% WW Population in Cities in 2050. *Frost & Sullivan*, May 2013

Energy Efficient Upgrades."

*SBA*. Web. 12 Dec. 2014.

Valentine, Katie. "Tweaking Thermostats In Boston Would Save Energy Equivalent To 17,000 Fewer Cars On The Road." *ClimateProgress*. 10 Dec. 2014.  
Web. 8 Dec. 2014.

Anesi, Jen. "Home Automation Products Gaining HVAC Industry Traction." *Achr News*. 25 Aug. 2014.  
Web. 8 Dec. 2014.