

## DATACENTERS AND COLOCATION

## SynapSense rides dynamic DCIM wave, widens ambitions

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SynapSense, a pioneer in using wireless sensor networks and analytics in the datacenter, nearly doubled its revenue in 2011, and expects to maintain a high double-revenue growth rate in 2012. Its monitoring and cooling optimization system is now being used in 300 datacenters, the company says. Due to its rapid growth, the company has now joined a small group of roughly five vendors in the datacenter infrastructure management (DCIM) sector whose growth and size significantly outstrip the competing field. The company is considering taking its technology outside of the datacenter market (for example, into the oil and gas industry). It is also investing more heavily in software that gives managers a better understanding of where to put their IT loads, based on real-time information in the datacenter.

### Context

SynapSense is one of the more closely watched DCIM companies, partly because it has attracted some \$42m in funding since it was formed in 2006 in Folsom, California. Investors include American River Ventures, Nth Power, DFJ Frontier, Emerald Technology Ventures, Crosslink Capital, Aeris Capital, GE Energy Financial Services, Robert Bosch Venture Capital and Sequoia Capital.

The company's Data Center Optimization platform consists of products and services that help datacenter operators get an accurate and baselined assessment of their energy use. As a follow up, it's Active Control system is designed to create a balanced cooling system, saving energy and freeing up cooling capacity that can be used to meet expanding IT loads.

Active Control incorporates the company's core innovations and differentiates the company from most other DCIM suppliers. The technology consists of a range of small wireless sensors and meters, designed by SynapSense and manufactured under contract; a wireless gateway that picks up the Mesh network data and feeds it back via Ethernet to the main server; and the management software, which consists of a data management system, optimizing algorithms, and reporting and dashboarding tools. A middleware layer manages integrations with building management, air-handling

and other systems. Once the data has been collected, the software constantly adjusts the airflow and temperature using the cooling, air-handling and BMS systems to ensure that the datacenter is operating within guidelines and at optimal efficiency, a process it calls 'constant commissioning.'

Typically, a datacenter will have hundreds or even thousands of sensors – the more that are used, the greater the level of control that is possible (if you don't do fine-grained tuning, you can't do fine-grained control). A typical configuration will have seven sensors per rack.

SynapSense is able to scale to millions of data points a day, helped by a combination of techniques designed to manage and reduce network traffic and avoid over-burdening the database. For example, it uses a non-SQL database for data collection, and the sensors only send data that has changed.

SynapSense has been developing the technology for over six years, and it now claims over 300 datacenter deployments. Among its customers are GE, Bosch, Dell, Bloomberg, Equinix, Facebook, Yahoo!, UBS, and RagingWire Enterprise Solutions. Deployments depend on size and complexity, and can range from \$50,000 to over \$2m. Some of its larger projects range from datacenters of 50,000-100,000 square feet, and involve several thousand sensors. Un-publishable revenue data available to 451 Research suggests SynapSense is now one of the leading four companies in DCIM revenue, a position it is likely to consolidate in the coming year. GE has the rights to resell its technology, although an agreement for HP to rebrand SynapSense's system has lapsed since SynapSense added more software.

All DCIM companies argue that the information they provide improves datacenter operational processes and efficiency, and all can partake in integrated systems using multiple products. SynapSense argues that its return on investment is more direct and immediate than most because the system begins optimizing immediately and uses one core product to drive the cooling. It claims to reduce datacenter cooling energy use by 30-60% per year.

## Enhancements

One issue for SynapSense has been its reliance on its own sensors to collect power and temperature data. Modern datacenters have become increasingly well-instrumented, and many have invested in some monitoring software. However, there is often poor integration of the data, and there is frequently a wide variety in quality and format of data between all the different sensors and meters.

In the past two years, SynapSense has been working to improve its use of non-SynapSense data sources, introducing better interfacing with underlying systems and introducing a PDU-monitoring device. The company argues, however, that its own sensors are usually cheaper and easier to deploy.

With sales rising, SynapSense is unusually well-capitalized in the DCIM sector. In the coming years, it is likely to invest in increasing its integration with IT systems, such as virtualization and provisioning management tools, so that managers can make decisions about where they put their IT loads, using data from SynapSense. The company also intends to improve its reporting and analytics, so that management can use SynapSense more as an overall management and planning system. At present, SynapSense wireless technology is not used to tag assets, as some other wireless systems are, but this is also an option for further development.

## Competition

The DCIM market in which SynapSense operates may look confused, with many overlapping and competing products, but there are some signs that the pieces are beginning to fall into place at last. SynapSense's role is to accurately monitor cooling and power using wireless monitors, and then to control the cooling units to reduce waste. Vigilant, formerly Federspiel, is a direct competitor, and is achieving good customer acceptance, while companies such as Schneider Electric and Emerson Electric can achieve this using multiple products. Other DCIM companies, such as FieldView Solutions, Sentilla, Power Assure and Modius, use monitoring data in different ways, with less direct focus on cooling optimization.

The market for optimization products and datacenter analytics has a long way to run. Suite suppliers such as Emerson, Schneider and nlyte Software are probably not directly competitive with SynapSense in most situations today, but that will likely change; equally, suppliers of building management systems are likely to push for a bigger role in the datacenter. And the full impact of modular datacenter designs has yet to be felt. All of this suggests a lively and competitive market. As it stands, the combination of wireless sensors and analytics is winning market acceptance.

## SWOT analysis

Strengths	Weaknesses
SynapSense has a proven, resilient and scalable technology with a growing customer base. The technology delivers a clear ROI.	SynapSense does not cover the entire range of DCIM functions (e.g., asset management), which may deter some customers. Some customers may view the technology as proprietary.
Opportunities	Threats
As datacenters are run hotter, and with more virtualization, they will become potentially less stable, creating a need for good optimization systems. Prefabricated datacenter suppliers may include SynapSense products. SynapSense can address any market where sophisticated cooling management is required.	SynapSense will face increasing competition from major, well-resourced vendors. SynapSense may find sales more difficult as IT vendors introduce better sensors and meters. Prefab datacenters may include non-SynapSense alternatives as standard.

## T1R take

Expectations have always been high at SynapSense. With substantial funding, the company's executives are under pressure to create – not just exploit – the emerging DCIM market, which was only worth about \$240m in 2011. Some of the early pilots using wireless sensors and dynamic cooling were not particularly successful, and for a while there was speculation that SynapSense might be over-engineered. But the company has fine-tuned the technology, and all the news in recent months has been positive, with revenue building rapidly and customers evangelizing the product. SynapSense is now a frontrunner in DCIM, a growing market that we believe will evolve toward increasingly sophisticated control solutions of the type SynapSense supplies. Other suppliers are moving in the same direction. In the longer term, we expect to see SynapSense looking to find new markets for its technology in other industries – the datacenter market will always be crowded, and the total addressable market is uncertain.

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