



A GREEN DATA CENTRE FROM SCRATCH

Wipro helps Aircel build a 50,000 sq ft data centre which not only follows DC best practices, but implements a range of ecofriendly solutions

The Aircel group is a joint venture between Maxis Communications Berhad of Malaysia and Sindya Securities & Investments Private Limited, with the former holding a majority stake of 74%. Aircel commenced operations in 1999 and became the leading mobile operator in Tamil Nadu within 18 months. In December 2003, it launched commercially in Chennai. Aircel began its expansion outside Tamil Nadu in 2005. The company has a foothold in 18 circles in the country today. It has over 25 million customers.

The company started expanding to new circles after the Department of Telecom allocated additional spectrum in 2008. Aircel chose to position the brand on value-added services and data. This meant that the network as well as the data centre to support these services had to be future-ready. They had to be geared up for 3G and MVNO (Mobile Virtual Network Operators) services and so on. The backbone had to be highly available and secure as well.

Aircel was looking at setting up its National Technology Centre (NTC), a green field data centre over 50,000 sq ft in Gurgaon. "Because of the huge size of the data centre, cost was a huge imperative. We wanted to keep the costs in check. We looked for technologies available that would help us minimize the operating costs and keep the TCO low," says Ravinder Jain, CIO, Aircel.

SNAPSHOT

ORGANIZATION:

- Aircel

INDUSTRY:

- Telecom

CHALLENGES:

- A green-field data centre of 50,000 sq ft had to be built in Gurgaon to deliver highly available, secure services for Aircel customers. This had to follow green practices to reduce the carbon footprint as well as keep costs in check.

SOLUTION

- The data centre uses many eco-friendly initiatives such as motion-sensor lighting, use of LED lights and CFLs, adaptive cooling, geothermal heat exchange and earth air tunnel for reducing load on chillers, solar water heating, and rain water harvesting.



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Aircel explored the technologies and best practices available that would help in this objective. It was Wipro's Eco Energy practice that impressed the Aircel team the most. “We chose Wipro because Wipro approaches the green initiatives in a conscious manner and not just as a fad. Their office is 100% green and they have green campuses in Bangalore.” Wipro and Aircel drew up the blueprint for the data centre.

The NTC occupies 50,000 sq ft of gross area. Of this, 18,000 sq ft is allotted to raised floor catering to 550 racks. The data centre adheres to the best practices prevalent in the world. It has an optimum redundancy, meeting Tier-III standards as per The Uptime Institute. Tier III is composed of multiple active power and cooling distribution paths, but only one path is active, has redundant components, and is concurrently maintainable. This provides 99.982% availability, as per the Institute.

The NTC has four 1.6 MVA backup diesel generators to provide power to all critical systems. These generators have fuel storage for 48 hours. The UPS system has been deployed in a redundant mode give 30 minutes of backup. The data centre has fire protection and is earthquake resistant as well. Security is monitored 24x7 with cameras in strategic positions. There are logs maintained for analysis. All the product systems are monitored for their critical parameters with intelligent building management systems. The NTC is modular, and uses products that can be easily expanded as the business grows.

There are engineers trained and dedicated to the

BENEFITS

- Staying green
- Reduced power and cooling needs
- Power Usage Effectiveness of 1.8
- Reduced carbon footprint by over 400 tons

site for manageability of the data centre round the clock, round the year. Wipro also has laid out detailed escalation and disaster prevention and recovery plans.

Wipro's Eco Energy team came up with many ideas that help Aircel bring down costs in the long run.

Lights off when no one's around

There is no need for lights to be left on in a data centre when no one is around. Equipping the data centre with motion sensors for lighting enables this in Aircel's data centre. Lights come on when there is any movement in the facility.

Using LEDs instead of high wattage lamps

Instead of regular lamps, the Aircel data centre uses LEDs and CFLs for lighting. In effect, the data centre is well lit while being able to reduce the energy being thrown out.

Improved chiller efficiency with earth air tunnel

A chiller in a regular data centre throws out cool air



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to cool the facility. In the Aircel data centre, this cooled air is then passed through an earth air tunnel to 450 ft below ground level. This further cools the air and is then circulated in the data centre. What this means is that the chiller does not have to work as hard as in other data centres to reduce the water and air temperature. A ground source heat pump pumps the heat from the ground, and the earth tunnel does its bit to act as a natural air conditioner. This improves the chiller efficiency.

Adaptive cooling reduces load

“Not all areas in the data centre require the same level of cooling. Most areas need between 18-20oC, while some places need between 12-14 oC. So cooling the entire data centre to these low temperatures is just a waste of energy. So we opted for adaptive cooling,” says Jain. In the Aircel data centre, cooling happens as per the requirements, and is not a fixed element.

Solar for water heating needs

For its hot water requirements, Aircel’s data centre is equipped with solar water heating systems. With this system in place, the water heating requirements are fully met using solar energy, and are not dependent of fossil-fuel based energy. Another eco-friendly implementation at the Aircel data centre.

Rainwater harvesting system

This is also part of Aircel’s CSR initiatives. Rain water is captured and stored to be used for gardening, washing and water for chiller. This ensures that keeping a green surrounding does not deplete the water table, or take unnecessary water from the main water supply.

Benefits

Staying green: The layout design of the NTC is based on the best practices of cooling, ergonomics, and modularity of expansion as the business grows. This ensures that the data centre has brought in green into

KEY FEATURES OF GREEN IMPLEMENTATION

- Motion sensor for lighting
- Using LEDs instead of high wattage lamps
- Using earth air tunnel and geothermal exchange
- Adaptive cooling
- Solar for water heating needs
- Rainwater harvesting system

its DNA and will grow on the same path as it evolves. The product selection is based on the efficiency and capacity plan to meet each stages of expansion.

Reduced power and cooling needs: The power distribution is based on the bus bar technology which enables seamless expansion of the data centre space. The cooling is based on best practices of raised floor, creating hot and cold aisles. With adaptive cooling and use of earth air tunnels and geothermal exchange, chiller efficiency is improved, and there is a reduction in chiller capacity requirement by 20%. The power and cooling meets the Uptime Institute standards as Tier -III. This means that the setup is concurrently maintainable and provides 99.982% availability.

Power Usage Effectiveness of 1.8: Using a range of technologies, techniques, design elements and systems, Aircel’s data centre’s Power Usage Effectiveness (PUE) ratio is 1.8. As per The Uptime Institute, most data centres have a PUE of 2.5. Hence Aircel’s 1.8 is a huge achievement because of the best practices implemented by Wipro practices.

Reduced carbon footprint by over 400 tons: as a result of all the green solutions deployed by Wipro at Aircel, the company has seen a reduced overall carbon footprint of over 400 tons a year.