IRENDER Aggarwal, the chief executive officer of Chennai-based software company Ramco Systems that develops enterprise cloud platform and products doesn't like excessive hardware and in-house data centres.

Ramco's cloud-based ERP solutions are hosted and delivered through Amazon web services, from the latter's data centres in Singapore, Sydney and the US. So, in order to "experience the pain that our customers feel if service is slow," Aggarwal says, Ramco employees also connect to the Amazon servers. Within the office, the attendance system, which earlier constituted registers and swipe cards, has been replaced by a QR-code based system, where all the employee has to do is scan the code with his or her smartphone.

Armco's employee self-service (ESS) application, which enables employees to access personal records, payroll and contact details has a user-friendly interface and can be accessed by iPhone, Android and Windows 8 users.

"A lot of services that earlier required computers and hardware are now on cloud and mobile. Data centres are gradually shrinking and this is one good way to reduce our energy bills," he says.

As organisations grow and demand for IT resources increases, chief information officers (CIOs) and network administrators look for ways to cater to these requirements without overshooting budgets. Today, in an eco-conscious world, IT managers have another problem to worry about — how does the organisation reduce energy consumption and make optimal use of existing resources, amid increased IT usage?

The solutions, at least partly, lie in adopting technologies such as cloud computing and virtualisation to reduce the use of servers and equipment.

Cloud computing is a method of delivering IT services through which users can access data stored in remote servers hosted on the internet via web-based tools and applications, instead of connecting to a local server. With cloud computing, organisations need not own data centres, instead they can lease servers from third party service providers. This helps reduce maintenance costs, facilitates expansions and upgrades.

Virtualisation is the process of creating a virtual operating system, hardware platform, storage device or network resource to reduce wastage of processing power and make maximum use of existing hardware and resources.
THE VIRTUAL DATA CENTRE

As organisations grow and demand for IT resources increases, network administrators look for ways to cater to these requirements without overspending budgets.

SERVER virtualisation, for example, is when a network administrator converts a single server into several virtual machines to manage separate tasks, thereby reducing space and cooling requirements. Servers are computers that provide services used by other computers on a network, and often host vast amounts of data and applications and run complex tasks.

However, several studies point out that most servers only use a small percentage of their actual processing capacities. As networks get more and more complex, companies are forced to expand the capacity of their data centres. Large server installations take up a lot of physical space, consume vast amounts of power and require significant amount of cooling as they tend to generate a lot of heat.

Indian businesses are expected to save $3.89 billion by 2020, in server spending, power, cooling, floor space, cost of manpower and overheads, by adopting virtualisation, according to a recent study by IT research and advisory firm, IDC.

The IDC Server Economics Index, a study commissioned by virtualisation and cloud infrastructure major Mare, recently reviewed the impact of server virtualisation in the Asia-Pacific region.

According to the IDC report, Indian firms will be able to avoid $2.37 billion in server spending (sale of physical servers), $666 million in power and cooling costs, $28 million in floor space costs, and $827 million in server administration costs (both in terms of people and other expenses related to managing servers).

BS Nagaarajan, director, systems engineering, India and SAARC, VMware, says virtualisation addresses “IT’s most pressing challenge — the infrastructure sprawl that compels IT departments to channel 70 per cent of their budget into maintenance, leaving scant resources for business-building innovation.”

The difficulty, he says, stems from the architecture of today’s x86 computers, which are designed to run just one operating system and application at a time. “As a result, even small data centres have to deploy many servers, each operating at just 5 per cent to 15 per cent of capacity, yet most x86 hardware consumes 60-90 per cent of the normal workload power even when idle.

This is highly inefficient by any standard,” he says.

Carbon footprint

In a 2011 paper published by Infosys Labs, titled ‘Going green with virtualisation’, the authors Nihil Chitnis, Randhri Bhaskaran and Tirthankar Biswas write that virtualisation can help reduce power consumption and carbon emissions and can help organisations be “perceived as greener and socially responsible corporate entities”.

They point out that right from manufacturing computers to packaging, shipping and assembling parts, as well as in operation, all the processes involved consume massive amounts of energy and natural resources. Though computers have become more energy-efficient, the rise in demand has resulted in net power consumption to double in the past five years, they write. In addition, the ambient temperature needs to be controlled in order to prolong the operating life of computers. It is estimated that for large data centres every watt of power consumed by the computers requires an additional watt for cooling,” they write.

As computers and other hardware are replaced every few years, organisations generate a large amount of e-waste, which, if not disposed properly ends up in landfills and can cause serious damage to the environment. With virtualisation, lesser materials are consumed in manufacturing, packaging, and in operations, and this also means lesser e-waste generated, the authors say.

From PI
MISSION COST CONTROL

Automatic apart from the green benefits, virtualisation enables organisations to purchase and maintain a lesser number of servers, thereby reducing hardware costs significantly. In a recent report, IT advisory firm Gartner says organisations can achieve better results in IT cost optimisation if they source IT in a flexible manner so they can remove or add resources, depending on business requirements.

Virtualisation software enables several operating systems and applications to run on one physical server or host with each self-contained virtual machine using as much of the host’s computing resources as required. Virtualisation ensures up to 80 per cent greater utilisation of every server, reduces hardware requirements and operations costs, and ensures annual savings of more than $1,500 for each server virtualised, says Nagarajan of VMware quoted earlier in this report.

Ankit Patange, director of data centre lifecycle services at Schneider Electric, says, “Virtualisation makes infrastructure vastly simpler and efficient. Applications get deployed faster, performance and availability soars, and operations become automated.

However, he adds, if the physical infrastructure in a data centre is not managed properly after virtualisation, it can increase energy costs.

“IT and business executives have realised that hundreds of thousands of dollars in energy and operational costs can be saved by improved physical infrastructure planning, minor system reconfiguration and by small process changes. The systems which allow management to leverage these savings consist of modern data centre physical infrastructure (that is, power and cooling management software tools),” he says.

Data centre infrastructure management (DCIM) software helps track power usage and determine areas where improved energy and operational efficiencies can be derived. “As power costs can be as high as 40 per cent of total operating costs for a data centre, the return on investment from DCIM software can be quite significant,” he says. The software also helps in capacity planning for increased usage, to manage assets better, and helps prevent failures by sending alerts when the threshold of any critical parameter is breached or a component has failed.

In the past few years, several organisations in the country, especially the leading IT firms, have made serious efforts to become more eco-friendly and reduce energy consumption. For example, Infosys has taken steps to restructure existing data centres and server rooms and has managed to free up 1,600 sq ft of server room/lab space, according to its Sustainability Report 2011-12.

The company says it has deployed desktop power management tools, which are designed to force-schedule shutdown of desktops. The company has replaced 7,000 older desktops with newer, efficient models, virtualised and consolidated servers wherever possible and has deployed tools which automatically check and shutdown idle project-specific servers.

Kalyan Kumar B, vice-president and chief technology architect at HCL Technologies, says, “Virtualisation and moving to cloud is definitely one of the most prominent ways that organisations are adopting to save on multiple expenses which include power, cooling, data centre hosting and management costs.”

Instead of entering into long-term contracts with vendors and service providers, which prove expensive in the long run in case the demand for IT resources decreases, Gartner is recommending sourcing IT on a variable basis. Organisations should only purchase and consume what is necessary, and IT managers should be aware and be able to predict IT requirements, in order to source IT in the most optimal manner, the report says.

With customers in Europe and other developed countries looking to cut costs and outsource their IT infrastructure maintenance to offshore service providers, virtualisation and cloud are an important part of most ‘business transformation’ deals that Indian IT firms have bagged in recent years. Cognizant’s senior vice-president, IT infrastructure services AN Rao, says the company has designed and implemented a number of successful virtualisation and cloud projects globally.

“Server virtualisation has helped our customers achieve up to 75 per cent reduction in power and cooling costs and 35 per cent reduction in hardware costs through cost amortisation. Besides increasing the average utilisation of the compute environment — even doubling it in many instances — virtualisation has helped bring down lead times for server provisioning from months to hours, and deliver substantial reduction in management costs via automated operations,” he says.

In India, organisations are beginning to move their non-critical workloads to cloud, and this process is happening in phases, says Kalyan Kumar of HCL.

“One of the first workloads that are moving to cloud is the non-critical environment, since this kind of environment provides a good opportunity and is low-hanging fruit for the organisation. They can see instant benefits without taking a lot of risks. The benefits may include capital expenditure (capex) to operational expenditure (opex) conversion, pay-per-use adoption, reduced complexity and low turnaround time,” he says. In the future, as cloud adoption increases, Indian firms will slowly become comfortable with moving more critical workloads to the cloud, he says.

When it comes to reducing costs and adopting eco-friendly practices, it’s not just the large organisations that are adopting virtualisation and cloud-based solutions. Rajesh Bhe, director of cloud and datacentre sales, Cisco India and SAARC, says that data centres can now be customised to meet the IT requirements of organisations across all verticals.

“Customers in India, both small and large enterprises, have risen above the early stages of data centre virtualisation and are open to unique concepts of high performing, cost-effective, low maintenance and energy-saving infrastructure which increases business productivity and provides high return on investments,” he says.

According to Rao of Cognizant, cloud adoption is much faster in the case of small and medium businesses as compared to large businesses. Large organisations tend to adopt hybrid models of private and public cloud, he says.

“In general, organisations in India are selectively moving applications and data to different models of private and public clouds by looking at implementing private clouds and aligning the implementation to refresh cycles, they are also considering public clouds selectively by profiling their IT landscape and moving non-core environments to clouds such as test and development, email for non-privileged users, and on-demand environment for disaster recovery,” he says.

VMware’s Nagarajan adds, “Even if the initial cost of virtualisation adoption is considered, some cases, it does not hamper the adoption since companies have realised the return on investment from this technology.”