ACHIEVING MAXIMUM DENSITY

Maxnet improves power and cooling capacity tenfold and saves a projected $1 million NZD a year with Dell blades and APC hot aisle containment.

CHALLENGE
Global trends toward blade server and virtualisation platforms have dramatically increased data centres’ power and cooling demands. Maxnet wanted a power and cooling solution that would enable it to meet future demands and help differentiate the company from its competitors. Maxnet also wanted to keep the environmental impact to a minimum by implementing the most energy efficient technology available.

SOLUTION
Maxnet now has ten times the power and cooling capability of a traditional data centre by deploying a hot aisle containment (HAC) solution from Dell partner APC. Energy-efficient Dell™ PowerEdge™ blade servers running VMware combined with the HAC infrastructure have drastically reduced electricity costs.

BENEFITS
GET IT FASTER
• HAC solution installed in 1 week

RUN IT BETTER
• 99% faster server deployments with virtualisation (1 hour vs. 1 month)
• 50% savings and 99.99% uptime for customers hosting on Dell/VMware

GROW IT SMARTER
• Tenfold greater power and cooling capabilities (30 kW/rack vs. 3 kW/rack)
• Projected $1 million NZD annual power savings
• 60% greater density with Dell blades vs. traditional 1U servers
• 90% reduction in rack space used for Maxnet’s own servers
Forward-thinking companies are accommodating this density by using hot-aisle containment, an increasingly popular strategy for efficiently cooling data centres by eliminating the mixing of hot and cold air. New Zealand’s Maximum Internet Limited (Maxnet), an Auckland-based hosting provider, recently rolled out its new Hot Aisle Containment Colocation Suite, the first and largest such facility in the country.

**10X GREATER RACK DENSITY**
The beauty of hot aisle containment technology is that by separating supply and return air paths, more cooling can be provided to servers using less energy. The hot aisle is sealed off using doors and ceiling tiles to contain the hot air.

“This is good news for anyone with a high density hosting requirement—we can handle virtually any power and cooling requirement you wish to challenge us with,” boasts Maxnet on its Web site. Such confidence is a result of a successful hot aisle implementation with help from Dell partner APC.

Maxnet chose Dell and APC because of their established association with hot aisle technology. “We already had a partnership with Dell, and Dell has a partnership with APC, which holds a patent on hot aisle,” says Maxnet CEO Brett Herkt.

Installation of the initial HAC solution took only one week, leaving Maxnet with a data centre that can provide up to 10 times the rack power and cooling capability of a traditional facility. “Hot aisle containment will allow us to accommodate 30 kW per rack, as opposed to around 3 kW per rack with traditional cooling methods,” explains Derek Gaeth, Maxnet’s chief technology officer. “We’re really going for high density, high efficiency computing and infrastructure. Most of the servers our hosting customers are bringing in these days are blades, so it’s safe to say that the trend toward higher density racks—and the growth in power and cooling required to support them—will continue.”

As many businesses are discovering, combining high-performance blade servers, centralized SAN storage and virtualisation technologies is an effective way to make the most of data centre space and respond to fast business growth. Companies can do more with a smaller footprint and fewer physical servers. But if growth doesn’t stop—and most companies hope it doesn’t—the result is often a data centre so dense that it challenges traditional hot aisle/cold aisle cooling configurations.

**“BY USING THE LATEST FREE COOLING TECHNOLOGIES ALONGSIDE HOT AISLE CONTAINMENT, WE FULLY EXPECT TO GET THE EQUIVALENT OF AROUND 6,000 PLUS HOURS A YEAR WORTH OF FREE COOLING OUT OF OUR SITE.”**

Derek Gaeth, chief technology officer, Maximum Internet Limited

---

**HOW IT WORKS**

**HARDWARE**
- Dell™ PowerEdge™ M1000e modular blade enclosures
- Dell PowerEdge M600 blade servers with Intel® Xeon® processors
- Dell/EMC CX3-20 SAN
- APC® InRow® coolers
- APC InfraStruXure® power distribution units

**SOFTWARE**
- Dell OpenManage™ Server Administrator
- APC InfraStruXure Central with Change and Capacity Manager modules
- VMware Virtual Infrastructure 3

**SERVICES**
- Dell ProSupport for IT
SAVING A PROJECTED $1 MILLION NZD A YEAR

Running HAC with chilled water means that Maxnet's facility doesn't have the dehumidification issues of a typical direct-expansion cooled data centre. “We don’t have to boil water all the time to keep humidity optimal,” says Gaeth. “We’re probably saving around $5,000 a year just by not running humidifiers. And because we’re not pushing air 40 metres around the server room, we don’t get huge static losses like a traditional cooling system does. There’s a lot of resistance involved in pushing air under a raised floor, back through the grates and up again. It’s quite inefficient.”

With hot aisle containment, efficiency is improved because neither the hot exhaust air nor cold inlet air has far to travel—only up to a maximum of four metres, according to Gaeth. Also, because hot-aisle containment gives Maxnet more uniform control over the server inlet temperatures from the top of the rack to the bottom, the company will be able to raise the temperature of its chilled water to maximise free cooling.

“By using the latest free cooling technologies alongside hot aisle containment, we fully expect to get the equivalent of around 6,000 plus hours a year worth of free cooling out of our site,” says Gaeth. “Once we’re full, it will be worth about $1 million NZD a year in power savings. Because we run a chilled water system, the hotter we can run the hot aisle in the HAC, the more efficient our system becomes.”

60% GREATER DENSITY WITH DELL BLADE SERVERS

Although most of Maxnet’s customers bring their own hardware into its colocation facility, the company recently standardized on Dell PowerEdge M1000e modular blade enclosures, Dell PowerEdge M600 blade servers and a Dell/EMC CX3-20 SAN for primary storage. With 60 percent greater density than traditional 1U servers, the M600 blade server is one of the most energy-efficient blade servers on the market, consuming up to 19 percent less power and delivering up to 25 percent better performance per watt than the HP BladeSystem c-Class and IBM BladeCenter H.¹ ²

“Dell is our first and foremost supplier for hardware, and for much of our enterprise software as well,” says Jeremy Nees, Maxnet systems manager. “Having one touch point with Dell gives us a good amount of leverage. If something’s not working out right, I don’t need to call different suppliers and have discussions about where the issue actually lies. I just call Dell and they take ownership of it. Dell ProSupport for IT has been excellent. It’s also a great relationship for us in terms of procurement. We have account managers at Dell that we deal with on pretty much a day-to-day basis. The turnaround has been within a couple of hours on most things. Dell’s model has worked very well for us.”

ROBUST POWER MANAGEMENT TOOLS

Nees appreciates that the Dell OpenManage Server Administrator provides power management tools that allow him to easily configure maximum power thresholds by server or server group. Alerts based on the Simple Network Management Protocol (SNMP) can be generated and recorded in hardware logs when readings cross predefined thresholds. Peak consumption times are also reported, and Maxnet engineers can reset peak observed watts/amps and cumulative power if necessary.

“Dell is our first and foremost supplier for hardware, and for much of our enterprise software as well,” says Jeremy Nees, Maxnet systems manager. “Having one touch point with Dell gives us a good amount of leverage. If something’s not working out right, I don’t need to call different suppliers and have discussions about where the issue actually lies. I just call Dell and they take ownership of it. Dell ProSupport for IT has been excellent. It’s also a great relationship for us in terms of procurement. We have account managers at Dell that we deal with on pretty much a day-to-day basis. The turnaround has been within a couple of hours on most things. Dell’s model has worked very well for us.”

“I like Dell OpenManage Server Administrator a lot,” says Nees. “It gives us very granular detail on how much power a server is drawing, and that’s information we need to optimise our business.”

Gaeth agrees. “It’s important for us to understand where all our power is going so we can keep on top of it and bill appropriately for usage,” he says. “We want to be able to measure our efficiency, because as the old saying goes, you can’t manage what you can’t measure.”

SAVING CUSTOMERS 50% WITH VIRTUAL HOSTING

Besides customer demand for higher density, Maxnet’s own move toward virtualisation was a major driver behind the data centre upgrade. By running VMware Infrastructure 3 software purchased through Dell on Dell blade servers, Maxnet was able to give itself more room to grow—and sell.

“We took five racks’ worth of equipment and condensed them down to half a rack,” says Nees. “We were then able to turn around and resell the other four racks to customers.”
For a hosting provider like Maxnet, being able to deploy new servers quickly is paramount—especially for customers that choose to host on the Dell blades instead of bringing in their own servers. “We can give a customer a new virtual server in a matter of an hour, versus waiting a month to procure and rack a new physical server,” says Nees. “And it’s far more economical and profitable for us to move toward virtualisation than to be selling hardware.”

Maxnet is having success selling its virtualised hosting services to new and existing customers. “We can offer companies a 50 percent savings over what it would cost them to build and maintain their own server infrastructure, and we’re able to offer 99.99 percent availability SLAs,” Nees observes. “It’s a compelling proposition.”

REMOVING THE OBSTACLES

Nees’ enthusiasm about virtualisation is buoyed by the fact that Maxnet won’t face any power and cooling obstacles as it strives for maximum density. “It’s great that we can get so much uptime and performance out of the Dell blades, the Dell/EMC SAN and VMware, but the key to supporting these technologies is through power and cooling,” he says. “Without the cooling and the power to support a high density blade environment, we’d lose many of the gains we’ve made through virtualisation.”

Data centres around the world will soon be embracing hot or cold aisle containment in response to the increase in density that’s occurring everywhere, Gaeth predicts.

“I don’t think there are many other options for the near future, to be able to accommodate the density that’s now required,” he concludes. “With energy-efficient Dell blade servers and our ability to benefit from Dell’s partnerships with technology leaders like APC, Intel and VMware, we feel that we’re well prepared.”


To read additional case studies, go to: DELL.COM/casestudies

SIMPLIFY YOUR TOTAL SOLUTION AT DELL.COM/Simplify

June 2009

Intel and Intel Xeon are registered trademarks of Intel Corporation in the United States and other countries. This case study is for informational purposes only. DELL MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS CASE STUDY.