atnorth

Case Study — More Compute

Achieve up to 80% cost efficiencies with HPC colocation

atnorth

atNorth Colocation Solutions are up to

80%

more cost efficient than running your cluster in mainland Europe.

The annual power bill for a future exascale system could easily exceed

$20 million

In the world of compute, everything is about getting as much capacity as possible for your calculations. Due to the capacity required to deliver true High Performance Computing (HPC), both securing power and finding it at highly competitive pricing becomes particularly relevant.

Cost-efficient and sustainable data centres with access to high amounts of power, present a considerable advantage for those seeking to maximise their compute investments. The sensitivity of High Performance Computing towards energy efficiency has continued to grow in the scientific community in recent years.[1] As compute capacity steadily improves, so does the ability to run more power-dense servers and rack configurations. This is not only a challenge from a power supply and cooling perspective, it also means that the impact of power consumption must be considered when deploying modern HPC environments.

Significant efforts have been made in recent years to work with application design that improves the energy efficiency for several HPC architectures. Concerns about energy efficiency and reliability have forced the industry players to re-examine the full spectrum of architectures, software, and algorithms that constitute the HPC ecosystem. But even with all these efforts and improved awareness of how application design must consider energy use and efficiency, the cost for power consumption is expected to increase faster than the gains in more energy efficient HPC systems. According to a report from the US Department of Energy, even with a projected ten-fold improvement in energy efficiency, the annual power bill for a future exascale system could easily exceed $20 million.[2]

With many HPC systems being deployed in traditional data center locations, often in urban areas and universities, this in itself presents a considerable challenge when it comes to maximising the compute capacity for the expected investment. Even if the HPC system is highly energy efficient, the power consumption is expected to increase over time due to more processors being used. This allows for considerably higher workloads and more complex calculations and simulations to be performed.

1. Performance and Power Analysis of HPC Workloads on Heterogeneous Multi-Node Clusters, J. Low Power Electron. Appl. 2018, 8, 13; doi:10.3390/jlpea8020013 www.mdpi.com/journal/jlpea
2. TheNextPlatform, SLASHING HPC ENERGY COSTS WITH AUTOMATED, DYNAMIC OPTIMIZATION, August 24, 2018 Ed Pitkin

atnorth

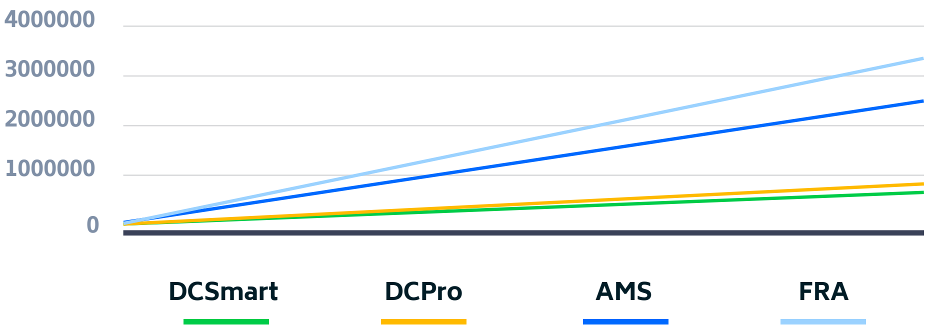
HPC POD configuration:

- 12 racks
- 18 kW per rack, 216 kW total
- 20 736 cores
- 80% average workload
- Cost for power + space (kW) and power consumption (kWh)
- kW and kWh prices based on public sources
- Included in kW – space, power access and cross-connects
- No Capex or lease of HPC equipment included

To be able to maximise compute capacity, the choice of where to deploy will have a significant impact on the cost to run any capable HPC system. Also, considering the increased need for power, sustainability and access to power must also be included in any serious HPC project. Locations that offer sustainable energy sources, ability to meet increased power demands over time at predictable and low cost energy levels. These present a clear advantage for any organisation seeking to maximise compute capacity for their investment.

Among the hidden costs of an HPC system, choosing the right facility and location for efficient cooling and power supply is one of the key things to manage. Power consumption will always be a major expense with high impact on the overall operational cost. Also, finding low and stable power pricing will allow the HPC system as a whole to be easier to operate when it comes to minimizing expenses. This becomes even more critical for larger deployments of HPC equipment. When the European Investment Bank rates current financing situations, the "High operational cost because of large energy consumption" is seen was one of the five most important items to manage when successfully investing in HPC systems.[3]

Total OPEX 5 years HPC pod



	DCSmart	DCPro	AMS	FRA
5 yr total kW + kWh	662 040 EUR	809 160 EUR	2 469 600 EUR	3 278 880 EUR
5 yr cost per Core	32,93 EUR	39,02 EUR	119,10 EUR	158,12 EUR

[3] Financing the future of supercomputing How to increase investment in high performance computing in Europe, European Investment Bank, 2018.

Run your cluster using atNorth Colocation Solutions and save up to

€ 2.6 million

over a 5 year period.

In this example, we have illustrated the cost of running a 12 rack pod with HPC equipment in two of the hot spots for data centers in Europe (Amsterdam and Frankfurt). This has been compared to the cost of our DCSmart and DCPro services.

DCSmart focuses on efficiency tailored colocation, while DCPro offers Tier 3 designed colocation solutions. Both levels of service are offered in our MJÖLNIR DC campus in Iceland.

After five years, the difference is significant. In fact, it almost allows a customer to buy a complete new 12 rack pod with over 20,000 cores just for the difference in running cost between Frankfurt and Iceland.[4]

To be able to maximise compute capacity, the choice of where to deploy will have a significant impact on the cost to run any capable HPC system. Smart investment choices involve taking sustainability and access to power into consideration when scoping any significant HPC project.

Organizations can leverage competitive advantage by colocating data center infrastructure and utlising the compute power available to them through a predictable low-cost, and less power-intensive environment. atNorth offer the ideal colocation solutions that will enable organizations to make substantial savings, and maximize their ROI.

Contact us today, to discover how we can help you achieve your compute potential and better cost/performance results.

4. Power consumption (kWh) and power infrastructure (kW, which includes cooling)

For more information contact:

atNorth Sales

sales@atnorth.com • +3545393282

atnorth.com

atnorth