Total Cost of Ownership Azure Marketplace

Red Oak Consulting – February 2025

Red Oak Consulting
Expert advice, exceptional delivery

Conducting a TCO modelling exercise to understand the true cost of your HPC will help you determine the best path forward for your HPC solution

,

Red Oak Consulting is a leading independent HPC and Cloud consultancy based in the UK. Our services cover the whole of the HPC and cloud lifecycle: strategy planning, expansion & optimisation, procurement, implementation and managed services.

Our expert team of consultants all have a diverse HPC & Cloud skillset which has been acquired over many years of working in the IT industry. Renowned for skill, adaptability and professionalism we continue to be instrumental in assisting all industry sectors on their HPC journey.

Understanding and performing TCO analyses allows you to better manage your HPC investments and ensure they align with your organisations financial and operational goals. When considering Cloud Solutions a HPC TCO analysis will compare the costs of on-premises Vs cloud options, factoring in variables like scalability, flexibility, storage and long-term expenses.

To aid customers, Red Oak Consulting has developed our own specialised TCO model to help companies achieve accurate results and insights, allowing them to make the right business investments tailored to their specific needs.

Understand your total cost of ownership (TCO) when running HPC

Traditional total-cost-of-ownership (TCO) models tend to adopt a cash-accounting approach, focusing purely on “money out of the door.” Often these models focus exclusively on local costs, ignoring costs elsewhere in the business.

The traditional approach however leads to a false (often optimistic) view of total cost. They certainly do not reflect the total cost to the organisation.

Our approach to TCO modelling is a two phased approach. First, we seek to identify and establish an accurate account of the general accounting principles associated to the full running of HPC:

- approach ongoing costs holistically across the organisation, capturing all costs;
- use full capitation rates for staff, etc;
- include estimates of inflation (for forward looking models);
- seek to measure depreciation charges for infrastructure;
- explore costs of capital;
- factor in R&D tax credits if appropriate;
- attempt to measure opportunity costs;
- inform results in the light of corporately agreed targets for internal rate of return (IRR).

This analysis will provide a clearer base cost for the existing, HPC service, in totality.

Understand your total cost of ownership (TCO) when running HPC

We then progress to phase two which is where we then follow an analysis of the service outputs to provide a comparable metric cost (typically cost per delivered core-hour). This typically includes:

- system availability;
- system utilisation;
- distribution of job sizes and run times;
- job wait times;
- job failure rates (due to system instability).

To deliver a more cost-effective output we look to take a risk-balanced approach to the analysis, iteratively improving the model through repeated error-reduction, i.e. focusing effort on those areas which will lead to the most reduction in numerical uncertainty of the result.

Understand your total cost of ownership (TCO) when running HPC

Compute	Storage	Backup	Data centre IT & networks	Extranet & internet connectivity
People: system support	People: user support	People: service management	Electricity (for all components)	Cooling
Facility costs	Financing effects	Security (physical & cyber)	Data security (IP etc.)	Resilience (systems)
Resilience (service)	Equipment monitoring	Service measurement & reporting	Insurance	Business continuity
Procurement project	Supplier management	Application porting	Data migration	Software licenses
User training & support	Documentation	Installation & commissioning	Warranty, support, maintenance	Decommissioning
	Availability	Billing latency		

Red Oak Consulting

Expert advice, exceptional delivery

www.redoakconsulting.co.uk