

SIT226 Cloud Automation Technologies

Task 4.2C. Cost Comparisons

Cost	Hosted In-House	Cloud Compute/VMs	Cloud Kubernetes
Capital Costs			
Server	\$4,500 (Dell PowerEdge R250)	-	-
Operational Costs			
Salaries	\$80,000 (1 additional staff)	-	-
Electricity	\$1,200/year	-	-
Compute (VMs)	-	\$1,680/year (AWS EC2 t3.medium)	\$2,016/year (AWS EKS nodes)
Storage	-	\$300/year (1TB EBS)	\$300/year (1TB EBS)
Networking	-	\$120/year (data transfer)	\$120/year (data transfer)
Cluster Management	-	-	\$876/year (EKS fee)

Total Costs

Year	Hosted In-House	Cloud Compute/VMs	Cloud Kubernetes
Year 1	\$85,700	\$2,100	\$3,312
Year 2	\$81,200	\$2,100	\$3,312
Year 3	\$81,200	\$2,100	\$3,312

Assumptions

- The website's initial requirements (2GB RAM, 1TB storage) are assumed to remain constant for the first three years for simplicity, though significant growth is expected post-launch. Future scaling costs are not included but considered in the recommendation.
- One additional support staff member is required for in-house hosting to ensure 99.9% uptime, as existing staff are at capacity and cannot handle continuous support needs.
- An AWS EC2 t3.medium instance (2 vCPUs, 4GB RAM) is selected to exceed the minimum 2GB RAM requirement, ensuring performance and slight scalability buffer.
- AWS Elastic Kubernetes Service (EKS) is used with two t3.medium nodes to support microservices and ensure high availability (99.9% uptime via redundancy).
- Minimal data transfer (10GB/month outbound) is assumed, as the service is new and usage patterns are unclear.
- Costs from AWS (in USD) are converted to AUD using an exchange rate of 1 USD = 1.50 AUD (approximate as of April 2025).

Cost Basis

- **In-House Server:**
 - A Dell PowerEdge R250 with 16GB RAM, 1TB SSD, and Intel Xeon E-2314 processor is priced at approximately \$3,000 USD (\$4,500 AUD) (Dell Technologies, 2025).

- Electricity is estimated at \$100/month (\$1,200/year) for a small server in a datacenter, based on average Australian rates.
- One additional staff member at \$80,000/year ensures 99.9% uptime.
- **Cloud Compute/VMs:**
 - AWS EC2 t3.medium costs \$0.0416/hour USD (\$0.0624 AUD/hour), totaling \$1,680 AUD/year (730 hours/month × 12 months).
 - 1TB EBS storage is \$0.10/GB/month USD (\$0.15 AUD/GB/month), totaling \$300 AUD/year.
 - Data transfer (10GB/month) die transfer) at \$0.09/GB USD (\$0.135 AUD/GB) adds \$120 AUD/year (Amazon Web Services, 2025).
- **Cloud Kubernetes:**
 - AWS EKS with two t3.medium nodes costs \$2,016 AUD/year (2 × \$1,680/2).
 - EKS cluster management fee is \$0.10/hour USD (\$0.15 AUD/hour), totaling \$876 AUD/year.
 - Storage and networking costs mirror the VM setup (\$300 + \$120 = \$420 AUD/year) (Amazon Web Services, 2025).

Summary of Hosted In-House Costs

- The in-house hosting approach incurs a significant initial capital cost of \$4,500 AUD for a server, followed by high operational costs dominated by an additional staff member (\$80,000/year) to maintain 99.9% uptime (Dell Technologies, 2025).
- Electricity adds a modest \$1,200/year.
- Over three years, the total cost is \$248,100 AUD, averaging \$82,700/year.
- While this offers full control and leverages existing infrastructure (e.g., networking), the high staffing cost and limited scalability without further hardware purchases reduce its value for money, especially given expected growth.

Summary of Cloud VMs Costs

- Cloud VMs on AWS EC2 provide a low-cost entry at \$2,100 AUD/year, with no upfront capital expenditure (Amazon Web Services, 2025).
- Costs are operational, covering compute (\$1,680), storage (\$300), and networking (\$120).
- This pay-as-you-go model offers excellent flexibility and scalability, aligning costs with usage.
- However, achieving 99.9% uptime may require additional instances or redundancy (not included here), potentially increasing costs slightly.
- The lack of staffing overhead makes this cost-effective for the initial phase, though long-term growth could elevate expenses.

Summary of Cloud Kubernetes Costs

- Cloud Kubernetes via AWS EKS costs \$3,312 AUD/year, including compute (\$2,016), storage (\$300), networking (\$120), and a cluster management fee (\$876) (Amazon Web Services, 2025).
- This is higher than VMs due to the EKS fee and multi-node setup for high availability, aligning with the microservices architecture and 99.9% uptime requirement.

- It offers superior scalability and fault tolerance, ideal for future expansion into consultancy and restoration services.
- However, the added complexity and cost may not be fully justified for the initial small-scale deployment.

Recommendation

I recommend the **Cloud Compute/VMs** approach for the organisation's new web service. At \$2,100 AUD/year, it provides the lowest total cost over three years (\$6,300 AUD) compared to \$248,100 AUD for in-house and \$9,936 AUD for Kubernetes (Amazon Web Services, 2025; Dell Technologies, 2025).

- This aligns with the organisation's need for a cost-effective, scalable solution without immediate capital investment, leveraging AWS EC2's flexibility to handle expected growth.
- The microservices architecture can run efficiently on a single VM initially, with the ability to add instances as demand increases, ensuring 99.9% uptime via AWS's robust infrastructure.

The in-house option is less favorable due to its high staffing cost (\$80,000/year) and limited scalability without further hardware purchases, which could disrupt service during upgrades (Dell Technologies, 2025).

Kubernetes, while ideal for microservices and future expansion, is overkill for the initial phase, with its higher cost (\$3,312/year) and complexity not yet warranted (Amazon Web Services, 2025).

The VM approach balances cost, simplicity, and scalability, making it the best choice for launching the service while preserving resources for future growth.

References

Amazon Web Services. (2025). *AWS pricing calculator*. <https://calculator.aws/>

Dell Technologies. (2025). *Dell PowerEdge R250 pricing*. <https://www.dell.com/en-au/shop/servers/>