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Ricoh Cloud Services AWS Optimisations Drive Sustainability Gains for National Broadband Ireland

NBI
National Broadband Ireland

- Reduces energy consumption
- Lowers carbon footprint
- Unlocks cost savings

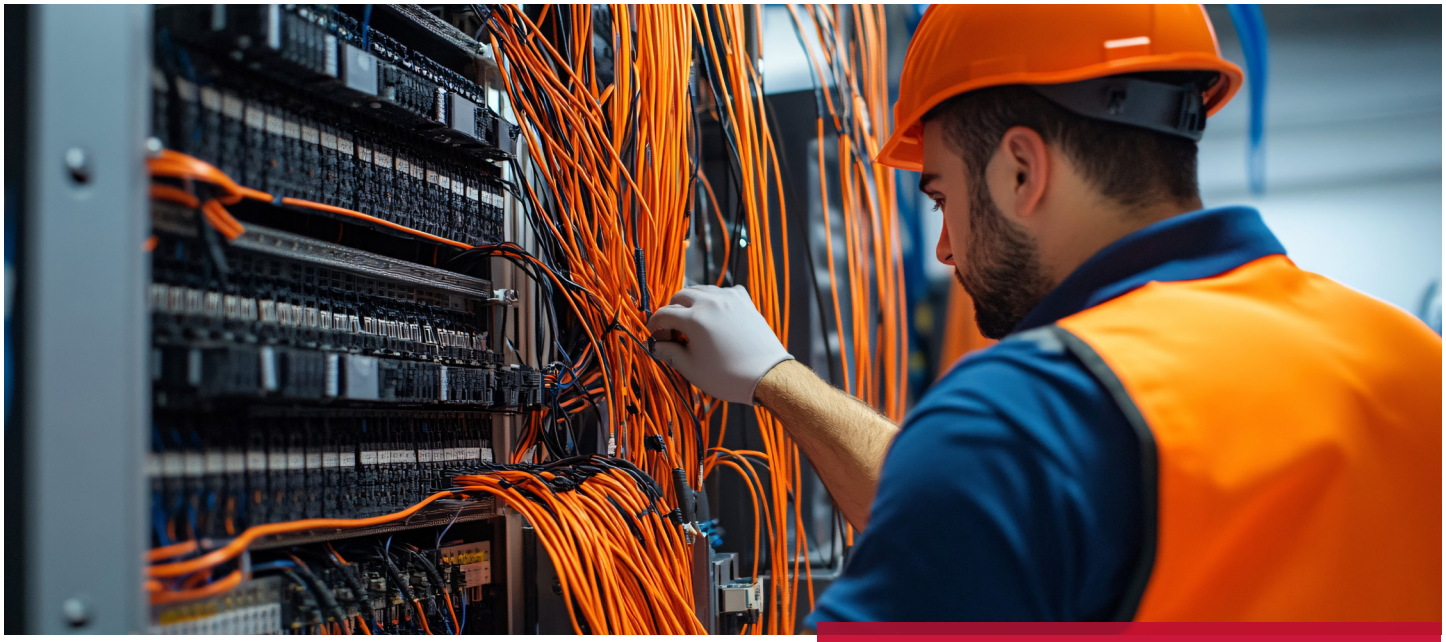
COMPANY & CHALLENGE

National Broadband Ireland was established in 2019 to fulfil the Irish government's ambitious National Broadband Plan (NBP) with the aim of rolling out high-speed fibre broadband to all premises in rural Ireland and to manage the network for 25 years.

For NBI, sustainability is integral to their mission. By connecting innovators through the rollout of high-speed fibre broadband all over Ireland, NBI are creating opportunities for progress and advancing innovative solutions to address climate change.

By championing equity and opportunity through equal access to the Internet, they are giving future policy makers and disruptors the chance to create long-lasting solutions to the challenges of climate change.

In keeping with this overarching goal, it's crucially important to NBI that the AWS platform on which they run their business operations is configured and managed with sustainability best practices in mind.



SOLUTION

In its role as AWS Managed Service Provider to NBI, Ricoh Cloud Services have responded to the challenge of optimising the NBI AWS environment for energy efficiency and reduced resource consumption. This case study explains 12 key AWS configuration optimisations implemented by Ricoh Cloud Services in the NBI AWS environment and how each contributed to lowering NBI's overall energy usage and resource consumption.

1. Adjusting PowerBI Data Processing Job Schedules:

Optimisation: Ricoh Cloud Services worked with the NBI team to adjust the scheduling of PowerBI data processing jobs to reduce the operational hours during which the AWS EC2 instance hosting the PowerBI application needed to run.

Sustainability Benefit: By aligning job execution schedules with actual business needs, Ricoh Cloud Services reduced the runtime of the EC2 instance, minimising its energy consumption. This led to less time spent on compute resources during off-peak hours, contributing to a lower carbon footprint.

2. Monthly Review and Decommissioning of Unused AWS Workspaces:

Optimisation: Ricoh Cloud Services performed a monthly review of AWS Workspaces, identifying dormant or unused workspaces and decommissioning them.

> The optimisations implemented by Ricoh Cloud Services not only improved NBI's AWS cost efficiency but also aligned with the company's sustainability goals, demonstrating how cloud infrastructure can be fine-tuned to reduce energy consumption and environmental impact.

Sustainability Benefit: By regularly shutting down inactive workspaces, NBI reduced unnecessary resource usage, preventing idle systems from consuming power. This helped eliminate wastage of storage and compute resources, cutting down on energy consumption and AWS costs.

3. **Decommissioning of Unused Sandbox Environments:**

Optimisation: Ricoh Cloud Services decommissioned various sandbox environments that were no longer actively being used by the NBI team.

Sustainability Benefit: The decommissioning of these environments reduced the number of running instances and storage volumes, leading to a direct reduction in energy and resource consumption.

4. **AWS CloudWatch Anomaly Detection:**

Optimisation: In NBI's non-production environments, the number of AWS RDS Aurora cluster instances was reduced from two to one.

Sustainability Benefit: By scaling down the number of database instances in non-production environments, Ricoh Cloud Services significantly cut down on the resources required to maintain these environments. Reducing the number of instances resulted in decreased energy use and lower overall emissions tied to database operations.

5. **Reconfiguring AWS ECS Clusters for Reduced Task Host Count:**

Optimisation: Ricoh Cloud Services reconfigured NBI's AWS Elastic Container Service (ECS) clusters in non-production environments, reducing the task host count from two to one.

Sustainability Benefit: Fewer task hosts meant less compute power was required, translating into reduced energy consumption for containerised applications. In non-production environments, where workloads were not as intensive, this adjustment prevented over-provisioning and unnecessary energy use.

6. **Using AWS Instance Scheduler for Start-Stop Schedule:**

Optimisation: Ricoh Cloud Services implemented AWS Instance Scheduler to enforce start-stop schedules for non-production EC2 and RDS instances, running them only from Monday to Friday, 8 a.m. to 8 p.m.

Sustainability Benefit: Limiting the operating hours of non-production instances reduced energy consumption during nights and weekends when these resources were not needed. This approach led to a significant reduction in the overall time that EC2 and RDS instances were active, lowering both energy usage and associated costs.

7. **Scheduling Non-Production ECS Clusters Using AWS Lambda:**

Optimisation: AWS Lambda was used to automate the start-stop schedule for non-production ECS clusters, mirroring the schedule applied to EC2 and RDS resources.

Sustainability Benefit: Automating the scheduling of ECS clusters ensured that containers were only running during business hours, reducing energy waste.

8. **Downgrading Non-Production EBS Volumes:**

Optimisation: Ricoh Cloud Services downgraded non-production Elastic Block Storage (EBS) volumes from the General Purpose SSD (GP2) class to the Throughput Optimised HDD (ST1) class.

Sustainability Benefit: The switch to a more energy-efficient storage class reduced the power requirements for storing non-critical data. By opting for ST1 over GP2 in non-production environments, NBI was able to significantly lower its storage-related energy consumption without compromising performance for non-essential workloads.

9. **Migrating Non-Production EFS Storage to Single-AZ:**

Optimisation: Ricoh Cloud Services migrated non-production Elastic File System (EFS) storage resources from a Multi-AZ

configuration to a Single-AZ configuration.

Sustainability Benefit: Single-AZ storage configurations consume fewer resources compared to Multi-AZ setups. By aligning storage configurations with the lower availability needs of non-production environments, Ricoh Cloud Services reduced the infrastructure's energy demands, leading to more efficient resource utilisation and a reduced environmental impact.

10. Introducing Storage Lifecycle Policies for EFS:

Optimisation: Ricoh Cloud Services introduced storage lifecycle policies into non-production EFS resources to move inactive data to the Infrequent Access (IA) storage class after a specified period of inactivity.

Sustainability Benefit: Moving infrequently accessed data to lower-cost, lower-energy storage tiers further reduced the energy footprint of NBI's storage infrastructure. This optimisation ensured that energy-intensive storage was reserved only for frequently accessed data, while less active data consumed minimal power.

11. Resizing Tableau Cluster Instances:

Optimisation: Ricoh Cloud Services resized three EC2 instances in NBI's Tableau cluster from m5.4xlarge (16 vCPUs) to r6a.2xlarge (8 vCPUs).

Sustainability Benefit: By choosing a smaller and more efficient instance type, NBI reduced the compute power and energy consumption required for Tableau workloads. The optimisation ensured that the cluster used only the necessary compute resources, preventing over-provisioning and wasted energy.

12. Resizing the PowerBI EC2 Instance:

Optimisation: Ricoh Cloud Services resized NBI's PowerBI EC2 instance from c5.9xlarge (36 vCPUs) to r7i.4xlarge (16 vCPUs).

Sustainability Benefit: Similar to the Tableau instance resizing, reducing the size of the PowerBI instance cut down on resource consumption and energy use. The smaller instance was still able to handle the required workloads, ensuring efficient use of compute resources and minimising the energy impact of running PowerBI in the cloud.

BENEFITS

Through the implementation of the 12 AWS configuration optimisations, Ricoh Cloud Services delivered substantial sustainability benefits for NBI. Collectively, the optimisations led to:

Reduced Energy Consumption: By aligning resource usage with business hours, rightsizing instances, and decommissioning unused resources, NBI significantly cut down its overall energy consumption across its AWS infrastructure.

Lower Carbon Footprint: Reduced resource usage in non-

production environments, optimised storage configurations, and more efficient compute power usage lowered NBI's carbon emissions associated with its AWS operations.

Cost Savings: By consuming fewer resources, NBI benefited from reduced AWS costs, contributing to both financial and environmental sustainability.

Improved Operational Efficiency: With fewer resources running in the background, NBI's IT team was able to focus on core production environments and critical workloads, enhancing overall operational efficiency.

In conclusion, the optimisations implemented by Ricoh Cloud services not only improved NBI's AWS cost efficiency but also aligned with the company's sustainability goals, demonstrating how cloud infrastructure can be fine-tuned to reduce energy consumption and environmental impact.

ABOUT RICOH

Ricoh is a leading provider of integrated digital services and print and imaging solutions designed to support digital transformation of workplaces, workspaces and optimise business performance. Headquartered in Tokyo, Ricoh's global operation reaches customers in approximately 200 countries and regions, supported by cultivated knowledge, technologies, and organisational capabilities nurtured over its 85-year history. In the financial year ended March 2024, Ricoh Group had worldwide sales of 2,348 billion yen (approx. 15.5 billion USD). It is Ricoh's mission and vision to empower individuals to find Fulfilment through Work by understanding and transforming how people work so we can unleash their potential and creativity to realise a sustainable future. For further information, please visit www.ricoh-europe.com

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