USU

White Paper

Unleash Full Cloud-Saving Potential with Reserved Instances

Hands-on strategies on how to optimize public cloud investments without compromising performance

Content

Introduction

In today's rapidly evolving digital landscape, organizations are increasingly turning to public cloud environments to power their applications and services.

While cloud computing offers scalability, flexibility, and on-demand resource allocation, it's essential to optimize costs without compromising performance. This is where Reserved Instances come into play.

Reserved Instances are a cost-saving mechanism provided by leading cloud providers such as AWS, Azure or Google, that allow you to reserve compute capacity in advance, unlocking substantial discounts compared to the standard pay-as-you-go model. Microsoft state customers can save up to 72% with Reserved Instances while Amazon state 75% savings are possible. However, understanding and effectively utilizing Reserved Instances can be a daunting task for those unfamiliar with the topic. This document aims to demystify Reserved Instances in public cloud environments, providing cloud users, admins, and FinOps practitioners with a comprehensive guide on how to leverage this powerful cost optimization strategy to maximize your cloud investments.

Benefits of Using Reserved Instances?

Reserved Instances are a way of purchasing a commitment to a certain type of cloud resource for a specified period, enabling customers to receive discounted rates on their instance usage.

They are suitable for steady-state workloads with predictable usage patterns, such as:

- database servers
- application servers
- continuous batch processing

Reserved Instances offer significant cost savings compared to On-Demand instances in public cloud environments. By committing to a specific instance type, region, and term, organizations can benefit from the following cost-saving mechanisms:

Reduced hourly rates

Reserved Instances provide discounted hourly rates compared to the pay-as-you-go pricing of On-Demand instances. The discount percentage varies based on the reservation type and the length of the reservation term. Typically, the longer the term commitment, the higher the discount.

Price predictability

Reserved Instances offer price predictability and enable organizations to accurately forecast and plan their cloud costs. With Reserved Instances, you have greater clarity future spend, providing stability and predictability in your cloud budgeting.

Higher utilization efficiency

By reserving capacity in advance, organizations ensure that instances are available whenever they need them, eliminating the risk of instances being unavailable during peak periods. This higher capacity assurance allows for better resource planning and utilization, ensuring optimal use of reserved capacity.

Instance sizing and family flexibility

Some Reserved Instance types offer instance size flexibility, allowing you to change the instance size within the same family during the term. This flexibility enables you to right-size your instances based on workload demands, optimizing costs by matching resources to your specific needs.

Long-term commitment savings

Longer-term commitments, such as one-year or three-year Reserved Instances, typically yield higher cost savings compared to shorter-term commitments. By committing to longer terms, organizations can access greater discounts, leading to substantial cost reductions over time.

It's important to note that while Reserved Instances provide significant savings, they are most suitable for workloads with stable and predictable usage patterns. Careful analysis of your workload requirements, utilization patterns, and available Reserved Instance options is essential to maximize cost savings and achieve optimal return on investment (ROI) when utilizing Reserved Instances in public cloud environments.

Be Prepared Before Purchasing Reserved Instances

Analyze usage patterns and workload requirements

Before purchasing Reserved Instances, analyze your workload's utilization patterns to identify suitable candidates for reservation.

Gather historical usage data

Collect historical data on your workload's resource utilization, such as CPU, memory, and storage usage, over a significant period. This data can be obtained from monitoring tools, logs, or cloud provider metrics. Analysing this data will help identify usage patterns, peak periods, and resource requirements.

Identify workload characteristics

Understand the characteristics of your workload, including its nature, purpose, and resource demands. Consider factors such as the type of application or service, the expected user load, data transfer requirements, and any specific constraints or performance requirements.

Determine workload stability

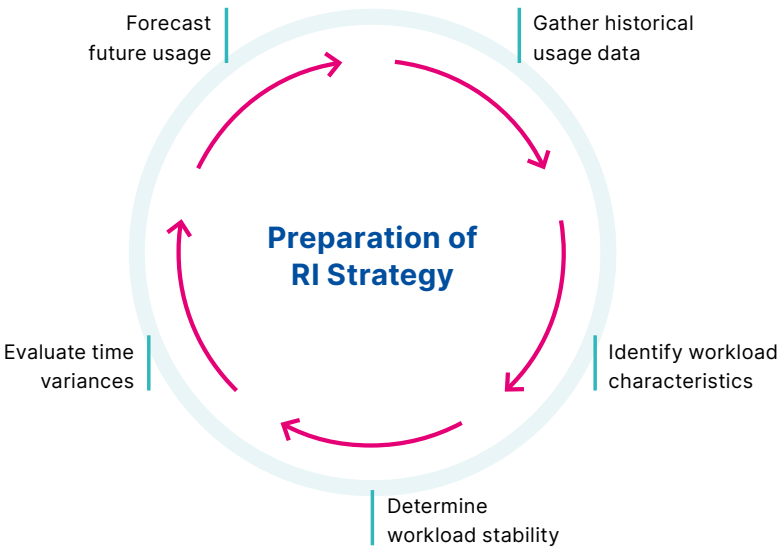
Assess the stability and predictability of your workload's resource utilization. Workloads that exhibit consistent usage patterns and have minimal fluctuations are suitable candidates for Reserved Instances. On the other hand, highly dynamic or unpredictable workloads may benefit more from On-Demand instances or other pricing models.

Evaluate time variances

Identify any time variances in your workload. Determine if there are specific hours, days, or periods of the week when the workload experiences increased demand or reduced activity. This information will help determine if Scheduled Reserved Instances, Savings Plans, or flexible scaling options are necessary to match workload requirements.

Forecast future usage

Use historical data and business projections to forecast future resource requirements. Consider any anticipated changes in workload size, growth, or seasonal fluctuations. This forecasting will assist in making informed decisions on the appropriate number and types of Reserved Instances to reserve.



Further steps you can take include

Consider multi-dimensional factors

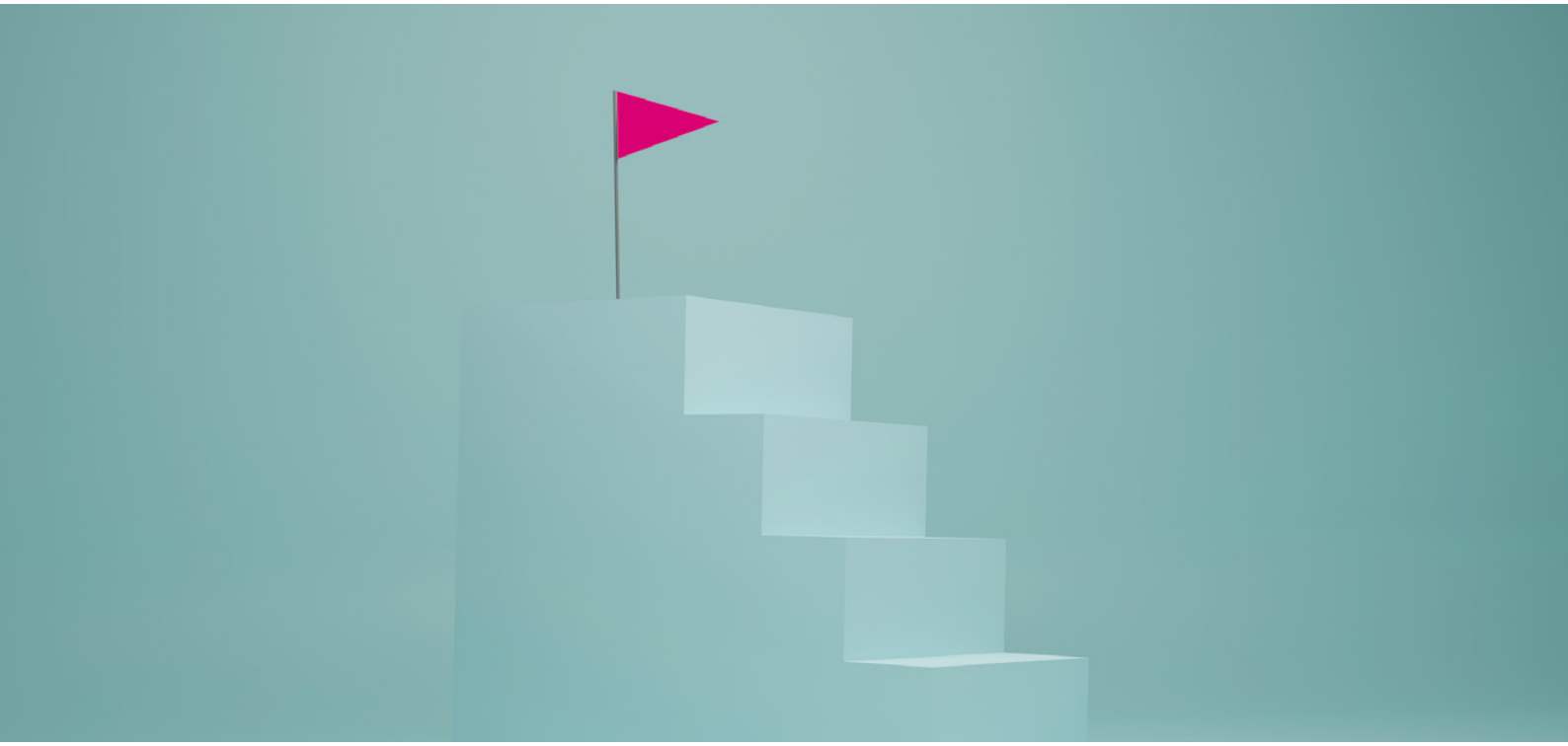
Assess workload requirements across various dimensions, such as region, instance type, operating system, and network connectivity. Evaluate the impact of these factors on resource utilization and availability in different regions or instance families.

Leverage cost estimation tools

Utilize cloud provider cost estimation tools, such as cost calculators or pricing APIs, to estimate the potential cost savings of different Reserved Instance options based on your workload characteristics and projected usage. These tools can provide insights into the financial impact of choosing specific reservation types and terms.

Review Reserved Instance recommendations

Cloud providers often offer recommendations or suggestions for Reserved Instances based on your historical usage patterns. Evaluate these recommendations and consider their alignment with your workload requirements. They can serve as a starting point for analysing usage patterns and determining the most suitable Reserved Instance options.



Calculate your cost savings and Return on Investment

Use the cloud provider's cost calculators to estimate potential cost savings based on your workload and Reserved Instance selections. Calculate the Return on Investment (ROI) for Reserved Instances by comparing the savings achieved with the upfront costs.

Gather usage and pricing data

Collect historical usage data, including resource utilization, instance hours, and associated costs. Obtain the On-Demand pricing for the same period. This data can be obtained from cloud provider billing reports, cost management tools, or APIs.

Determine Reserved Instance costs

Identify the Reserved Instance costs based on the chosen reservation type, term, and instance attributes. Reserved Instance costs typically include upfront payments (if applicable) and the hourly usage rate.

Calculate the On-Demand costs

Multiply the On-Demand pricing per hour by the total instance hours consumed during the evaluation period. This represents the total cost that would have been incurred if the instances were running entirely on the On-Demand pricing model.

Calculate Reserved Instance costs

Multiply the Reserved Instance hourly rate by the total instance hours consumed during the evaluation period. Add any upfront payment costs if applicable. This represents the total cost of using Reserved Instances for the same instance hours.

Determine cost savings

Subtract the Reserved Instance cost from the On-Demand cost to calculate the cost savings achieved by utilizing Reserved Instances. This represents the amount saved by reserving capacity in advance.

Calculate ROI

To quickly calculate the ROI of Reserved Instances, you can use the formula:

$$\text{ROI (\%)} = \frac{(\text{Cost Savings} - \text{Upfront Payment})}{\text{Upfront Payment} \times 100}$$

For example, if you spent $500,000 on Reserved Instances that gave savings of $750,000 when applied, your calculation would be:

$$\frac{(\$750{,}000 - \$500{,}000)}{\$500{,}000 \times 100}$$

which gives an ROI of **50%**.

Consider additional factors

Keep in mind that calculating ROI solely based on cost savings may not capture the complete value of Reserved Instances. Consider other factors such as:

- improved cost predictability
- higher resource availability
- capacity assurance

when evaluating the overall benefits and ROI of Reserved Instances.

Purchase Reserved Instances in the cloud provider's portal

Reserved Instances are a great way to save on On-Demand Instances for your business. If you pay for Reserved Instances, you are paying to rent the Instance for a period. Buying a Reserved Instance is easy.

- Access the cloud provider's management console and navigate to the Reserved Instances section.
- Select the desired instance type, region, term, and payment option.
- Review the purchase details and confirm the reservation.

Manage & Optimize Reserved Instances

Some Reserved Instance types allow modifications during the term. Review the cloud provider's documentation for supported modifications. Modify Reserved Instances to match changing workload requirements, such as resizing instances, changing regions, or updating the operating system.

Monitor and track utilization

Regularly monitor and track the utilization of your Reserved Instances to ensure they are being effectively utilized. Utilization monitoring helps identify instances that are underutilized or instances that have unanticipated changes in workload requirements. This allows you to make adjustments such as resizing instances, modifying instance attributes, or exchanging Convertible Reserved Instances for better alignment with workload demands.

Utilization analysis and right-sizing

Analyse workload performance and resource utilization patterns to identify opportunities for right-sizing instances. Right-sizing involves matching the instance size to the actual workload requirements, ensuring you have the appropriate level of resources without over-provisioning. By optimizing instance sizes, you can avoid unnecessary costs and improve efficiency.

Reservation management

Keep track of your Reserved Instances, including their types, terms, regions, and expiration dates. Establish a reservation management process to effectively plan and renew reservations based on changing workload demands. Regularly review and adjust your reservations to align with workload changes, ensuring optimal coverage and cost savings.

Examine instance attributes and families

Stay informed about new instance types, families, and features offered by your cloud provider. Evaluate if migrating Reserved Instances to newer generations or updated instance families can provide improved performance, cost savings, or additional features that align with your workload requirements.

Utilize instance flexibility options

Leverage the instance size flexibility offered by certain Reserved Instance types. If your workload requirements change, consider modifying the instance size within the same family during the reservation term. This allows you to match the resources more accurately to the workload's evolving needs without the need for a new reservation.

Plan for workload changes

Anticipate changes in workload requirements and plan your Reserved Instances accordingly. If you expect workload growth or scaling, consider reserving additional instances or opting for longer-term reservations to secure capacity and maximize savings.

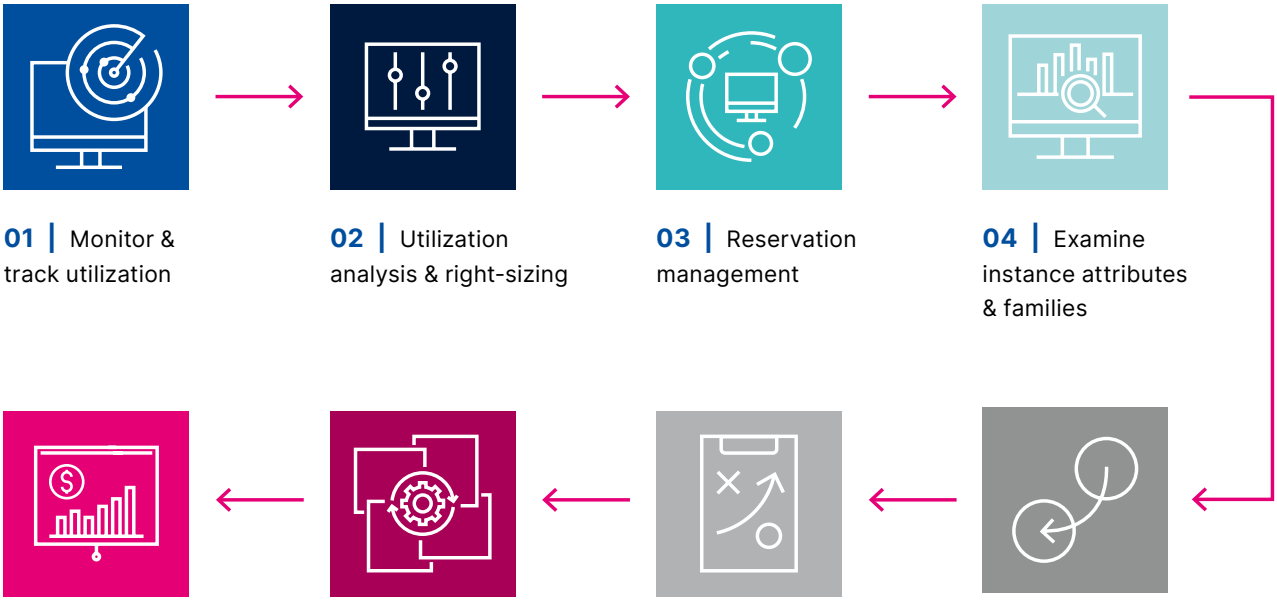
Leverage marketplace or third-party tools

Explore cloud marketplace offerings or third-party tools that provide Reserved Instance management and optimization features. These tools can help automate reservation management, provide insights into utilization patterns, and recommend optimization strategies to ensure efficient utilization of Reserved Instances.

Regular cost analysis

Conduct regular cost analysis to evaluate the cost savings achieved through Reserved Instances. Compare your actual costs with the costs that would have been incurred under the On-Demand pricing model. Identify areas for further optimization and adjust your Reserved Instance strategy accordingly.

By implementing these management practices, you can effectively utilize and optimize your Reserved Instances, ensuring cost efficiency and maximizing the return on your cloud investment. Regular monitoring, utilization analysis, right-sizing, and strategic planning are key elements of successful Reserved Instance management.



Renewing and Expanding Reserved Instances

Renewing Reserved Instances

Monitor expiration dates

Keep track of the expiration dates of your Reserved Instances to ensure timely renewal. Establish a process for tracking and managing reservations nearing expiration to avoid any disruptions in capacity or cost savings.

Evaluate workload needs

Assess your workload's current and future requirements before renewing Reserved Instances. Determine if the existing reservation type, term, and instance attributes still align with your workload's needs. Consider any changes in workload patterns, growth projections, or other factors that may influence your reservation renewal decision.

Utilization analysis

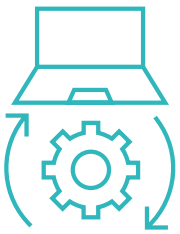
Analyse the utilization of your existing Reserved Instances. Identify underutilized instances that can be modified or resized to optimize resource allocation. Evaluate the cost savings achieved through the current reservations and compare them with the available options.

Adjust reservation terms

Consider adjusting the reservation terms based on workload changes. If you anticipate long-term usage or workload stability, opting for longer-term reservations (e.g., three-year terms) can provide higher savings. Conversely, if you anticipate changes in your workload requirements, shorter-term reservations may offer more flexibility.

Prioritize critical workload

Prioritize the renewal of Reserved Instances for mission-critical or high-priority workloads. Ensure that the capacity for these workloads is secured to avoid any service disruptions or performance issues.



Expanding Reserved Instances

Analyse workload growth

Assess your workload's growth projections and scaling needs. Determine if expanding Reserved Instances is necessary to meet the anticipated increase in demand. Analyse historical usage patterns and future requirements to estimate the additional capacity required.

Evaluate reservation options

Explore the available Reserved Instance options to expand capacity. Consider the instance types, sizes, and terms that align with your workload's requirements. Evaluate the potential cost savings and commitment lengths associated with the expansion options.

Coordinate with workload changes

Coordinate the expansion of Reserved Instances with workload changes or migrations. If you plan to modify or resize instances as part of the expansion, ensure that the timing aligns with workload migration or modification activities to minimize disruptions.

Consider different types of Reserved Instances

For example, if you anticipate frequent changes in your workload requirements, consider utilizing Convertible Reserved Instances. These reservations provide the flexibility to modify the instance attributes during the term, allowing you to adapt to changing workload needs without the need for a new reservation.

Conduct regular reviews

Regularly review your Reserved Instances portfolio to assess their continued alignment with your workload needs. Analyse the utilization, cost savings, and performance of your reservations. Identify any changes in workload requirements or opportunities for optimization.

Work with stakeholders

Talk to the other parts of your business who use cloud now and those who may use it in the future. Understand what their plans are for cloud usage over the next 12 – 36 months and determine how this may impact your Reserved Instance use. Use that to model how your cloud costs will change in relation to certain business projects and initiatives.

Adjust and modify as needed

Based on the review findings, adjust, and modify your Reserved Instances as necessary. This may involve resizing instances, modifying instance attributes, exchanging Reserved Instances, or renewing reservations with different terms to optimize cost savings and resource allocation.

Reporting and Cost Management

Reporting and cost management with Reserved Instances are essential for understanding and optimizing your reservation usage and cost savings. Here are some options and strategies available for reporting and managing costs associated with Reserved Instances:

Cloud provider cost management tools

Most cloud providers like Microsoft Azure or Amazon AWS offer built-in cost management tools that provide reporting and analysis capabilities for your Reserved Instances. These tools typically provide detailed usage reports, cost breakdowns, and reservation utilization metrics. They help you track your reservation coverage, identify underutilized or unused instances, and calculate your cost savings. Familiarize yourself with the cost management tools provided by your cloud provider and leverage their reporting features.

Microsoft Azure Advisor

This provides suggestions around idle and under-utilised resources to help optimise your cloud spend. Recommendations include:

- When to shutdown unused resources
- How to right-size workloads to fit the workload onto less expensive resources
- Identifying unattached storage volumes
- Where workloads can be run on less expensive, variable resources known as “Burstable SKUs”
- Finding unused networking subscriptions

See more information **here**.

Azure Cost Management & Billing

A more comprehensive and business focused offering than Advisor, Azure Cost Management and Billing includes features such as:

- Report on and analyse costs in the Azure portal, Microsoft 365 admin centre, or externally by exporting data.
- Monitor costs proactively with budget, anomaly, and scheduled alerts.
- Split shared costs with cost allocation rules.
- Create and organize subscriptions to customize invoices.
- Configure payment options and pay invoices.
- Manage your billing information, such as legal entity, tax information, and agreements

Enabling you to monitor your costs now and in the future.

AWS Cost Explorer

The AWS Cost Explorer is a free* tool that allows you to see, interrogate, and forecast your AWS spend, giving reports across areas such as:

- Per service costs
- Reserved Instance reports
- Savings Plans reports
- Hourly granularity
- Spend per account

And more, enabling you to filter a variety of data and model future usage.

*There is an AWS Cost Explorer API that is $0.01 per request and Hourly/Resource level granularity costs $0.01 per 1,000 Usage Records per month.

See more information **here**.

Reserved Instance utilization reports

Utilization reports provide insights into the usage patterns and efficiency of your Reserved Instances. They offer information on how effectively your reservations are utilized, including details on hours used, hours remaining, and percentage utilization. Utilization reports help you identify opportunities for optimizing reservation usage, resizing instances, or modifying reservation attributes to align with workload demands.

Cost allocation tags

Implementing cost allocation tags allows you to categorize and allocate Reserved Instance costs based on specific attributes, such as departments, projects, or applications. By tagging your Reserved Instances, you can gain granular visibility into the cost distribution and identify areas where cost optimization measures can be applied. This information enables you to allocate costs accurately and optimize resource allocation based on business needs.

Reserved Instance purchase recommendations

Some cloud providers offer Reserved Instance purchase recommendations based on your historical usage patterns. These recommendations suggest the optimal reservations to purchase to maximize cost savings. By leveraging these recommendations, you can ensure that you are reserving the right capacity and taking advantage of the most cost-effective options for your workloads.

Third-party cost management tools

Third-party tools and services, such as **USU Cloud Cost Management as a Service**, are available that specialize in cloud cost management and optimization. These tools provide advanced reporting capabilities, cost analysis, and optimization recommendations specifically tailored for Reserved Instances. They often offer additional features like cost forecasting, instance resizing suggestions, and scenario modelling to help you make informed decisions about your reservations.

Regular cost reviews and optimization

Conduct regular reviews of your Reserved Instance costs and performance to identify potential areas for optimization. Review your usage reports, cost breakdowns, and reservation utilization metrics to assess the effectiveness of your reservations. Look for opportunities to resize instances, modify attributes, or exchange Convertible Reserved Instances to align with workload changes and optimize your cost savings.

Automated cost management and alerts

Implement automated cost management practices and alerts to monitor your Reserved Instances' cost and utilization. Set up alerts that notify you when instances are underutilized, reservations are about to expire, or cost thresholds are exceeded. Automated tools can help you proactively manage your reservations and take action to optimize costs and utilization.

Savings Plans

Savings Plans are available with both Amazon AWS and Microsoft Azure and can be seen as a more flexible next step from Reserved Instances. With these you make a 1 or 3 year hourly spend commitment without the need to choose a specific resource type in a specific region – giving a higher level of flexibility, albeit for a slightly lower level of discount.

Conclusion

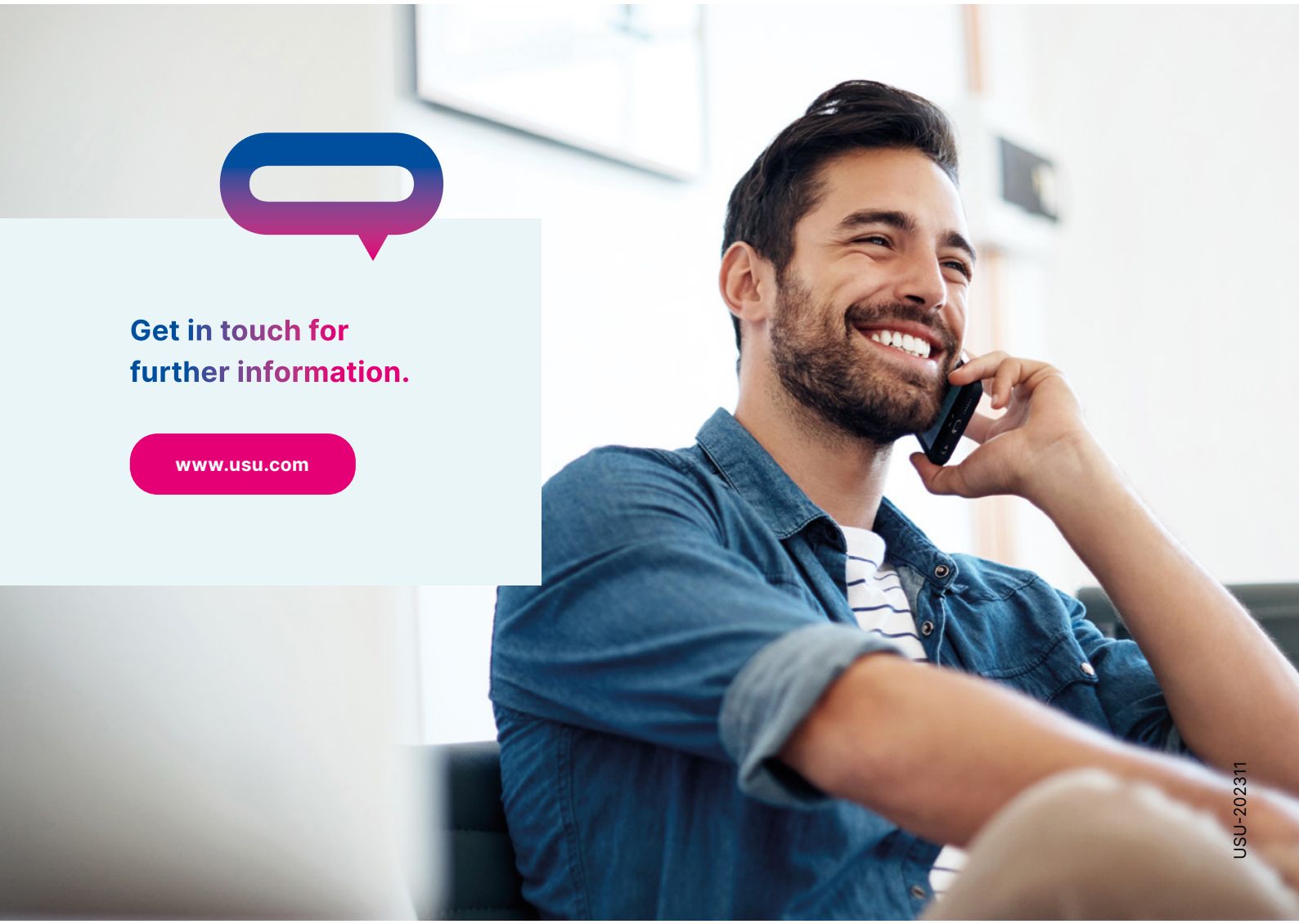
Leveraging Reserved Instances in public cloud environments offers significant cost-saving opportunities and optimization benefits for organizations.

By effectively managing Reserved Instances, ITAM and FinOps practitioners can achieve substantial cost reductions, improve resource utilization, and optimize their cloud infrastructure. Throughout this white paper, we have explored key aspects of utilizing Reserved Instances, including analysing usage patterns, calculating cost savings and ROI, managing reservations, optimizing utilization, and leveraging auto-scaling.

By adopting these best practices and implementing effective Reserved Instance management strategies, businesses can achieve tangible cost reductions, optimize resource utilization, and enhance the efficiency of their public cloud environments. As IT asset managers, embracing Reserved Instances and employing the techniques discussed in this document empowers you to make data-driven decisions, align cloud spending with business needs, and maximize the value of your organization's cloud investments. By optimizing Reserved Instance usage, you can achieve substantial cost savings, enhance performance, and drive operational excellence in your organization's cloud environment – helping show ITAM as the strategic, business focused discipline that it can be.

About USU

As the leading provider of software and services for IT and customer service management, USU solutions empower companies to meet the demands of today's digital world. Global companies use our solutions to cut costs, drive agility, and reduce risk – with smarter services, streamlined workflows, and improved collaboration. With over 40 years of experience and locations worldwide, the USU team helps customers move into the future.



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