

# Cost Control

## Service Specification

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# Service Specification

<b>Service Name:</b>	<b>Cost Control (Standard/Premium)</b>
<b>Service Level Hours:</b>	Business Hours (9x5)
<b>Unit of Charge:</b>	Fixed Fee model (based on bands of spend); Initial Term 12 months, Renewal Term 12 months
<b>Prerequisite Cloudeach Services:</b>	For Cost Control Premium, Cloudeach requires the accounts payable / billing relationship with the Cloud Provider
<b>Supported Cloud Platforms:</b>	AWS, Azure and GCP (limited)
<b>Product Codes</b>	CO-COST-CONTROL-STANDARD CO-COST-CONTROL-PREMIUM
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## The Small Print

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## Definitions

The definitions and rules of interpretation in this clause and as set out in the [Service Definition Document](#) shall apply. Any capitalised terms used but not defined shall have the meaning prescribed to them in the Service Definition Document.

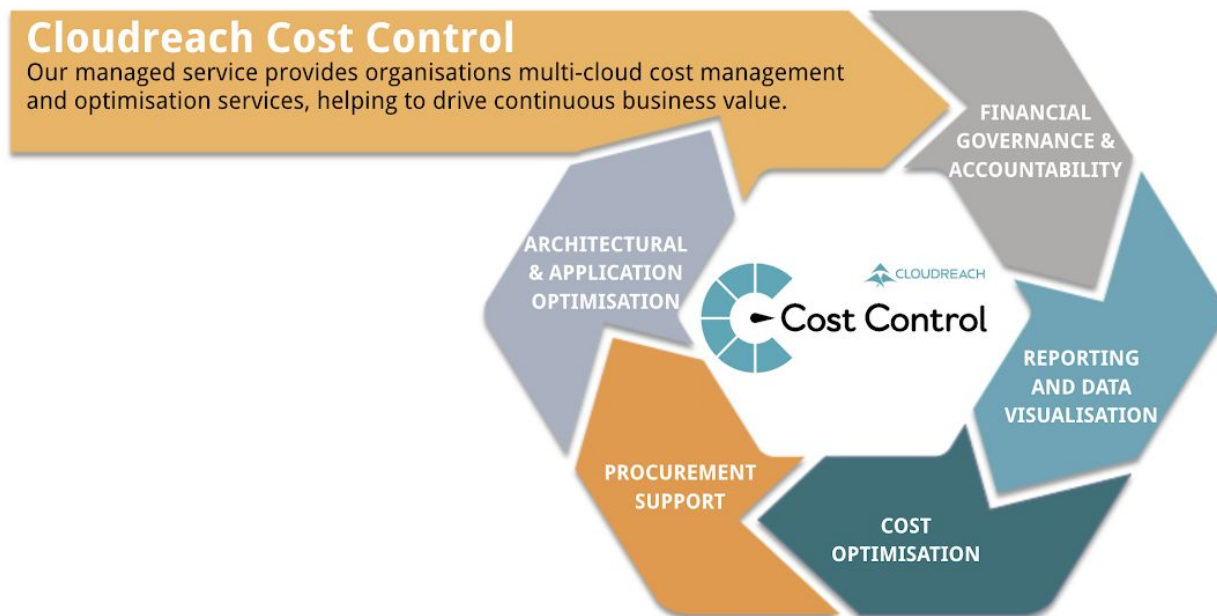
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# Executive Summary

Cost Control is designed to address and overcome many of the challenges that enterprises face with public cloud billing, usage insight, financial governance and cost optimisation (including exploring opportunities for optimisation at the architectural and application-level).



A summary of the key components of Cost Control are listed below:

- **Financial Governance and Accountability** - Established governance, ownership, tagging policies, aided with monitoring and automation;
- **Reporting and Data Visualisation** - Reports, dashboards and visualisation of the enterprise cloud spend;
- **Cost Optimisation** - Continuously identifying cost optimisation opportunities and ensuring they are executed to ensure tangible cost savings;
- **Procurement Support** - Procurement and finance support including: Custom invoicing, EDP planning and volume discount purchasing, budget tracking, converting CSP credit and other incentives as a way to offset Cloudreach service costs;
- **Architectural & Application Optimisation** - Delivery manager coordinates access to Cloudreach experts who will work with the customer to analyse and make recommendations to optimise the architecture and applications cost.

# Service Tiers / Plans

Cost Control is available under two tiers / plans, **'Standard'** and **'Premium'**. These are defined below:

	<b>Standard</b>	<b>Premium*</b>
<b>Financial Governance and Accountability</b>	✓	✓
<b>Reporting and Data Visualisation</b>	✓	✓
<b>Cost Optimisation</b>	✓	✓
<b>Procurement Support</b>	x	✓
<b>Architecture and Application Optimisation reviews</b>	x	✓

\* For Cost Control Premium, Cloudreach requires the accounts payable / billing relationship with the Cloud Provider.

## Limits

Cloudreach imposes the soft limits set out in Appendix A (the "Limits") in respect of Cost Control. If Customer exceeds the Limits, Cloudreach shall notify Customer and work with Customer to understand the reason for exceeding the limits and attempt to find a solution or workaround. If Customer consistently and regularly exceeds the Limits, as determined by Cloudreach, Cloudreach shall be entitled to charge customer an additional fee for the exceeding of Limits.

# Financial Governance and Accountability

## (Included in both Standard and Premium Tiers/Plans)

In order to produce more effective and accurate billing and optimisation reports, established accountability tagging policies are monitored and managed from automated resource tagging through to tagging policy enforcement.

### Governance and Accountability Monitoring

Cloudreach will monitor the tagging status of AWS EC2, EBS, RDS and S3 resources plus Azure Resource Groups, Virtual Machines, Storage Accounts, SQL Servers and SQL Databases and on a four-hourly schedule will:

- Implement up to five custom tag alerting schedules as agreed with Customer during Onboarding. Additional tag alerting schedules may be implemented by the Cost Control Delivery team subject to the limits in Appendix A below.
- Each alert schedule is customisable in the following manner:
  - Combination of tags to be monitored;
  - Exception criteria (presence/absence, format of tag value);
  - Audience to receive alert, which may be one or more Customer-supplied email addresses;
  - Frequency of re-alerting in event of continued non-compliance (in hours, days or weeks, with a minimum frequency of 6 hours); and
  - Action to be taken in the event of an alert (Instance shutdown / Instance termination / alert only).

### Governance and Accountability Enforcement (AWS-only)

In order to enable effective cost allocation against EC2 Instance child resources, Cloudreach will apply EC2 Instance and EBS volume tagging enforcement policies and if required, enable automated hierarchical tagging of EC2 child resources on a four-hourly basis which will:

- Update the tags of all AWS EBS volumes associated with an EC2 Instance to include Customer-nominated tags associated with the Instance; and
- Update the tags of all AWS volume snapshots associated with an AWS EBS volume to include the Customer-nominated tags associated with the AWS EBS volume.

# Reporting and Data Visualisation

## (Included in both Standard and Premium Tiers/Plans)

- Cloudreach provides access to a Cloudreach portal to gain ultimate visibility of Cloud Provider spend;
- Cloudreach provides detailed showback capabilities by breaking down cloud spend data as per defined cost allocation policies;
- Cloudreach offer detailed reports based on a number of facets of billing data and common breakdowns. Customers can also customise reports through the Cloudreach portal or via Cloudreach upon request;
- Budget Tracking and Alerting monitors expenditure and provides monthly reporting of budget allocation performance and alerting when actual and predicted spend exceeds defined thresholds.

## Detailed Showback

Cloudreach will present the Customer with multiple showback reports based on their cloud spend:

- The Customer will define the required Cost Allocation Groups. These Groups can represent breakdowns for sub-organisations, business units or services the Customer offers;
- The Customer shall notify Cloudreach in writing of the Cost Allocation Group stakeholders, business units or sub-entities (and appropriate contact, address and tax information) who will receive showback reports for each Group;
- The Customer will agree the format of each invoice in either PDF or CSV.

Changes to the defined Cost Allocation Groups, stakeholders or other details will be submitted by the Customer to the Cloudreach Service Desk, as a Billing and Optimisation Support Request, following the Incident raising process described in the Support section further below.

## Reporting

Cloudreach will provide detailed reporting based on a number of facets of billing data. Cloudreach shall provide the predefined reports listed below in "Standard Reports" using common report criteria as well as a custom reporting tool for the Customer to use to generate reports requiring information not captured in the dashboard reports. The billing data for the reports is updated daily. Report data can be presented in a number of different formats, including as graphs and as CSV for ingestion into the Customer's business systems. Note that as tax is added by the cloud provider when a Customer's monthly cloud spend has been finalised, all reports will exclude tax.



## Management of the Customer Billing Dashboard

The Cost Control Delivery team will:

- Configure and setup a Billing Dashboard on behalf of the Customer, implementing all requirements as captured within a billing workshop, including:
  - Standard reports;
  - Custom reports;
  - Budget alerts.
- This setup will comply with any limits of the Service as outlined in Appendix A to this Service Specification.

The Cost Control Delivery team will manage the Billing Dashboard by:

- Configuring, maintaining and updating any email alerts and distributing reports to key Customer stakeholders as agreed in writing with the Customer;
- Configuring customer access to the Billing Dashboard as and when requested;
- Configuring custom dashboards for the Customer;
- Reviewing cloud consumption and usage with the Customer on a monthly basis;
- Updating the permissions to the cloud Provider Accounts to ensure the necessary cost, performance and usage data is being ingested into the Billing Dashboard;
- Utilising the Billing Dashboard to obtain resource performance and financial optimisation data to feed into Cloudreach processes to develop optimisation roadmaps.

## Training

The Cost Control Delivery team will provide training to the Customer on how to access and use the Billing Dashboard in accordance with the Limits set out in Appendix A.

These training sessions will cover:

1. An overview to the Billing Dashboard;
2. Configuring a custom dashboard and generating custom reports;
3. Cost allocation and reallocation;
4. Rightsizing, AWS Reserved Instances and cost optimisation;
5. Accountability management;
6. Resource scheduling and cloud automation.

## Standard Reports

The following standards reports will be generated daily, weekly or monthly (as applicable) and available to view by the Customer:

For AWS:

Report Name	Description
Per Cost Allocation Group	Report showing spend in each Cost Allocation Group
Per AWS product (e.g. EC2, S3)	Report showing spend for each AWS product
Per AWS tag (e.g. where tag=value)	Report showing spend for each tag value.
Product-per-time-period (e.g. EC2 spend per day/week/month)	Reports by day/week/month showing spend for each AWS product.
Product-per-usage-type (e.g. spend per m3.large EC2 instance)	Report showing spend for each instance type in EC2
Product-per-resource-placement (e.g. spend in eu-west-1a)	Report showing spend for each AWS product in each region or availability zone
Spend-per-purchase-option (e.g. spend by Reserved Instance)	Report showing spend for on-demand instances vs spend for reserved instances

For Azure:

Report Name	Description
Per Cost Allocation Group	Report showing spend in each Cost Allocation Group
Per Azure product (e.g. VMs, Blob storage)	Report showing spend for each Azure product
Per Azure tag (e.g. where tag=value)	Report showing spend for each tag value
Product-per-time-period (e.g. VM spend per day/week/month)	Reports by week and month showing spend for each Azure product
Product-per-usage-type (e.g. spend per Basic_D6 VM)	Report showing spend for each VM sub-category
Product-per-resource-placement (e.g. spend in West Europe)	Report showing spend for each product in each region

During Onboarding, the Customer can choose to receive these reports by email. Access can also be provisioned by logging in to the Billing Dashboard.

Reports can be delivered in a number of different formats:

Format	Details
PDF	Graphs and summaries only
CSV	Tabulated data only, without graphs

## Custom Reporting

The Customer may independently configure and generate reports based on a wider range of facets including:

- **Billing period** (e.g. 1st October - 30th November)
- **Aggregation period** (e.g. Daily)
- **Cost Allocation Group** (e.g. development accounts)
- **Provider Account** (i.e A single cloud provider Account)
- **Service** (e.g. EC2, Azure Virtual Machines, etc)
- **Usage type** (e.g. AWS m4.large, Azure Standard\_F1, etc)
- **Tag** (e.g. BU="IT Services")
- **Resource placement** (e.g. AWS eu-west-1, Azure North Europe, etc)

Once configured, these reports shall be delivered to the Customer in accordance with a delivery plan (e.g. daily, weekly, etc) of their choosing, or can be accessed by logging in to the Billing Dashboard. Additionally, custom reports can be created in the Billing Dashboard by the Cost Control Delivery Team.

## Budget Tracking and Alarms

Cloudreach shall help allocate annual budgets and monitor expenditure for the Customer's Provider Accounts by providing a monthly summary to each invoice stakeholder illustrating the spend to date compared with the budget provided by the Customer. The summary will show:

- Cost Allocation Group name;
- List of Provider Accounts;
- Annual budget;
- Budget starting month;
- Actual spend this month;
- Actual spend since start of budget period;
- Budget rate of spend graph.

Cloudreach will assess the costs compared to the budgeted amount for each Cost Allocation Group on a daily basis. During Onboarding, the Customer can choose to have a notification sent by email in the event that the costs reach either one of two thresholds defined by the Customer.

The notification email will show:

- Invoice Group name;
- Alarm name;
- Current percentage of budget.

Example thresholds:

Alarm name	Threshold
Warning	80% of pro-rated annual budget
Critical	95% of pro-rated annual budget

# Cost Optimisation

## (Included in both Standard and Premium Tiers/Plans)

Cloudreach will generate a monthly financial optimisation report consisting of phased Rightsizing and Reservation recommendations, identifying orphaned and underutilised for AWS EC2 and/or Azure Virtual Machine resources and performing AWS cloud resource scheduling.

With the aim of reducing monthly spend, Financial Optimisation provides actionable, phased and validated optimisation measures specific to customer requirements. This includes:

- AWS EC2 and Azure Virtual Machine rightsizing-reservation roadmaps;
- AWS RDS, ElastiCache and DynamoDB reservation roadmaps;
- AWS and Azure orphaned resource removal;
- AWS and Azure underutilised resource removal;
- AWS EC2, ASG, RDS, Aurora, Redshift or Azure VM scheduling to customer defined schedules.

## Phased Rightsizing and Reservation Recommendations

As part of the monthly financial optimisation report, Cloudreach will produce a cost and performance-based phased rightsizing and reservation roadmap detailing:

- AWS EC2 Instance or Azure Virtual Machine reservations that could be repositioned to ensure optimal use of reservation spend, nature of the recommended repositioning and approximate savings to be made by repositioning;
- AWS EC2 Instances or Azure Virtual Machines currently receiving benefit from existing reservations, with preference for optimally sized Instances;
- Where performance-based utilisation criteria are available, AWS EC2 Instances or Azure Virtual Machines that are optimally sized and not receiving benefit from reservations which are above reservation break-even points and are targets for immediate reservation and approximate savings to be made by reserving;
- Where performance-based utilisation criteria are available, AWS EC2 Instances or Azure Virtual Machines that are potential targets for rightsizing and subsequent reservation, and approximate savings to be made by by rightsizing and reservation;
- Where performance-based utilisation criteria are available, AWS EC2 Instances or Azure Virtual Machines that are potential targets for rightsizing only, and approximate savings to be made by rightsizing;
- (AWS-only) Elasticache Instances which are potential targets for reservation, and approximate savings to be made by reserving;

- (AWS-only) DynamoDB tables which are potential targets for capacity reservation, and approximate savings to be made by reserving; and
- (AWS-only) RDS Instances which are potential targets for capacity reservation, and approximate savings to be made by reserving.

Cloudreach will attempt to identify the owner of resources identified in the monthly optimisation report plan either by Customer-defined rules mutually agreed during Onboarding, or by tag (if applicable) if the Customer has implemented a tag containing an email address identifying the resource owner. In such cases, Cloudreach will liaise with Customer resource owners to validate the recommendations identified in the optimisation plan against constraints on implementation, to include:

- Capacity planning affecting the resource
- Technical constraints affecting the resource
- Lifecycle of the resource

Upon validation of the recommendations identified in the monthly report, Cloudreach can liaise with Customer resource owners to help them implement recommendations, or directly implement the validated recommendations of the monthly optimisation plan.

## Orphaned and Underutilised Resource Termination

As part of the monthly financial optimisation report, Cloudreach will include details of:

- (AWS-only) Orphaned EBS volumes that can be decommissioned and the approximate savings to be made by decommissioning;
- (AWS-only) Orphaned, aged or excessive number of EBS snapshots in relation to customer defined snapshot limits or backup policies that can be deleted and the approximate savings to be made by deletion;
- (AWS-only) Orphaned Elastic IPs which can be deleted and the approximate savings to be made by deletion;
- Underutilised EC2 instances or Azure Virtual Machines that are candidates for stopping/terminating and approximate savings to be made by stopping/terminating.

Cloudreach will attempt to establish the owner of resources identified in the monthly financial optimisation report either by Customer-defined rules mutually agreed during Onboarding, or by tag (if applicable) if the Customer has implemented a tag containing an email address identifying the resource owner. In such cases, Cloudreach will liaise with Customer resource owners to validate the recommendations identified in the financial optimisation report against constraints on implementation, to include:

- Capacity planning affecting the resource
- Technical constraints affecting the resource
- Lifecycle of the resource

Upon validation of the recommendations identified in the monthly report, Cloudreach may liaise with Customer resource owners to help them implement recommendations, or directly implement the validated recommendations of the monthly optimisation plan.

## Cloud Resource Scheduling

Cloudreach will deploy scheduling tooling within the Customer's AWS or Azure environment and will configure up to five custom scheduling rules as agreed with the Customer during Onboarding. Additional scheduling rules may be implemented by the Cost Control Delivery team subject to the limits in Appendix A below.

Each scheduling rule is customisable in the following manner :

- Combination of one or more tags and associated values which will trigger scheduling events;
- Shutdown time and days of week for Instances matching the scheduling rule;
- Optional restart time and days of week for Instances matching the scheduling rule;
- Optional opt-in tag key which will flag Instances not meeting the normal tag criteria to be included in scheduling events;
- Optional opt-out tag key which will flag Instances not meeting the normal tag criteria to be excluded from scheduling events; and
- Optional inclusion of auto-scaling groups in the scheduling rule.

Cloudreach-deployed tooling will run scheduling events as follows for Instances:

- IF
  - an Instance meets the Customer-specified tagging criteria for a scheduling rule;
  - OR an Instance contains the optional opt-in tag key for a scheduling rule;
  - AND the Instance does not contain the optional opt-out tag key for a scheduling rule;
  - AND the Instance is not already shut down at the time of rule evaluation
- THEN
  - the Instance will be stopped at the Customer-specified shutdown time on the Customer-specified days.
  - AND if an optional restart time has been specified by the Customer, the Instance will be restarted at the Customer-specified restart time on the Customer-specified days.

## Optimisation and Insight Reporting

In addition to the monthly optimisation reports and cloud spend invoices, Cloudreach will include a high-level headline report, identifying spend hot-spots, including:

- Identifying the delta in overall spend in terms of percentage increase or decrease in spend since the previous month;
- Identifying the primary cloud services that contributed to the increase or decrease in spend since the previous month;

- Identifying any subsets of total spend (for up to two Customer-nominated tag keys) where the delta in spend for the subset varies by more than or equal to a customer-nominated minimum variance value;
- Providing a breakdown of usage corresponding to their respective budgets.

Additional Customer custom reports may be added by the Cost Control Delivery Team.

## Training

Cloudreach will provide to Customer one “Financial Optimisation Day” every quarter. This Financial Optimisation Day will:

- Provide basic information on the key concepts of public cloud billing and financial optimisation to key Customer stakeholders;
- Discuss customer progress in financial optimisation;
- Review and identify new opportunities for ongoing financial optimisation activities;
- Provide a strategy/roadmap for financial optimisation efforts moving forward.

The Optimisation Day will be delivered remotely/virtually.



# Procurement Support

## (Included only in Premium Tier/Plan)

Cloudreach provides a scalable and customisable billing service to consolidate Cloud Service Provider (“CSP”) spend as well as optionally provides first-tier Cloud Provider technical support. This consists of **five** main components:

- Cloud Invoicing
- Cloud Spend Visibility
- Cloud Provider Account Provisioning
- Cloud Commercial Terms [\[AWS-ONLY\]](#)
- Cloud Technical Support [\[AWS and AZURE ONLY\]](#)

## Cloud Invoicing

Cloudreach will become the reseller for the Customer CSP usage. Instead of engaging directly with multiple Cloud Providers, such as Amazon Web Services (“AWS”), Microsoft Azure and Google GCP, the Customer can consolidate cloud usage invoicing and billing support under Cloudreach, receiving consolidated bills for each CSP provider.

In order to for Cloudreach to invoice the Customer for CSP usage, Cloudreach shall either resell Customer a Cloud Provider Account or bring Customer’s existing Provider Accounts within the control of Cloudreach. Cloudreach shall become part of the billing relationship between the Customer and the Cloud Provider; this is an administrative only billing relationship where the Customer will retain control of their AWS Linked Accounts, Azure Subscriptions and GCP Projects.

The Customer shall assist Cloudreach to bring Cloud Provider Accounts under Cloudreach’s billing control and shall provide Cloudreach with the necessary billing access for all applicable Cloud Provider Accounts. Onboarding prerequisites and requirements are described in the Information Gathering Documentation.

Before or during the Onboarding phase, the Customer will outline:

- The chosen CSP(s) and associated Cloud Provider Accounts to be onboarded;
- Where applicable, any changes to their chosen Support Plan(s) for their Cloud Provider Accounts;
- The required invoicing currency. Note that if the defined currency is outwith the supported CSP currencies, the Exchange Rate will be applied;

- The stakeholders to receive Cloudreach invoices.

Before invoicing, Cloudreach Billing Specialists shall audit and verify that Customer charges are correct, before issuing the finalised invoice to Customer specified stakeholders.


Cloudreach will issue invoices on a monthly basis and do so approximately 1 week after the CSP finalises their charges; usually between the 3rd and 5th of the month. Customer invoices will include:

- Customer CSP usage charges broken down by Provider Account in the Customer-specified currency;
- Customer CSP Support charges, e.g. AWS Enterprise Support;
- Any CSP Reservation (or equivalent) charges;
- Any CSP Marketplace (or equivalent) charges;
- Any purchased Cloudreach services or products;

An example invoice displaying the format is shown below.

The Customer shall pay Cloudreach within 30 days of receiving the invoice unless otherwise agreed with Cloudreach.

The Cloud Invoicing component is the most basic level of invoicing provided by Cloudreach. Customised invoicing measures can be addressed with Cost Control.



## INVOICE

<b>Billing Address</b>	<b>Shipping Address</b>	<b>Invoice Group</b>	123	
The Customer Customer Billing Address Customer Billing Postcode Customer Billing Country	The Customer Customer Shipping Address Customer Shipping Postcode Customer Shipping Country	<b>Invoice Number</b>	SIN123456	
		<b>Invoice Date</b>	dd/mm/yyyy	
		<b>Customer Tax Number</b>	tax_number	

Customer PO Number	Order Number	Invoice Currency	Due Date
po_number	12345	GBP	dd/mm/yyyy

	Product Name	Quantity	Unit Price	Tax Code	Tax Value	Net Value
1	AWS Resale Product Code: RESALE-AWS-USAGE RESALE-AWS-USAGE for account 1234567890 (Production) for period 1 <sup>st</sup> July 2018 - 31 <sup>st</sup> July 2018	1	£20,000	Nil	£0	£20,000
2	AWS Resale Product Code: RESALE-AWS-USAGE RESALE-AWS-USAGE for account 1234567891 (Development) for period 1 <sup>st</sup> July 2018 - 31 <sup>st</sup> July 2018	1	£10,000	Nil	£0	£10,000
3	Azure Resale Product Code: RESALE-AZURE-USAGE RESALE-AZURE-USAGE for subscription jafd93j0dk1ms01x (Staging) for period 1 <sup>st</sup> July 2018 - 31 <sup>st</sup> July 2018		£30,000	Nil	£0	£30,000
4	Cloudreach Cost Control Product Code: CO-COST-CONTROL		£2,000	Nil	£0	£2,000
					<b>Net Total</b>	£62,000
					<b>Tax Total</b>	£0
					<b>Invoice Total</b>	£62,000

Tax Summary			
Tax Code	Tax Rate	Net Value	Tax Value
GB-Q-STD	20.000%	£31,000	£6,200

**REMITTANCE ADVICE**  
For further remittance advice enquiries, please email  
customer.accounts@cloudreach.com

**Please make payments as follows:**  
<payment\_details\_here>



## Cloud Spend Visibility

Cloudreach shall provide a detailed breakdown of Cloud Provider spend, showing exactly where the Customer money is attributed, in turn helping Customers push critical information to key stakeholders. This will be made available in the form of regular email reports. Cloudreach shall also help establish customised budgets and alert to designated Customer stakeholders when projected and/or actual budgeting thresholds are exceeded.

### Detailed Usage Reports

On **AWS**, Cloudreach shall send the Customer reports containing:

- Your current and last month of usage and an estimate of your projected cost for the month;
- Visibility of your historical monthly cost by Service across all AWS Accounts;
- A list of EC2 Instances running across all AWS Accounts,
- A list of EBS Volumes, Images and Snapshots across all AWS Accounts;
- Instance Usage by Reservation Type;
- A list your RDS Usage, including RDS Instances, RDS Snapshots, RDS Reservations and RDS Cost by Account;
- A summary of S3 Storage in GB, a running total of the number of S3 Buckets, API Requests and any Data Transfer Out;
- S3 Storage by Storage Type.

On **Azure**, Cloudreach shall send the Customer reports containing:

- Your current and last month of usage and an estimate of your projected cost for the month;
- Visibility of your historical monthly cost by Service across all Subscriptions;
- A list of Virtual Machines running across all Subscriptions,
- A list of Storage Accounts, Disks and Snapshots across all Subscriptions;
- Virtual Machine Usage by Reservation Type;
- A list your SQL Databases.

On **GCP**, Cloudreach shall send the Customer reports containing:

- Your current and last month of usage;
- Visibility of your historical monthly cost by Service across all Projects;
- A list of Virtual Machines running across all Projects,
- A list of Buckets, Disks and Snapshots across all Projects;

In addition, Cloudreach can also generate a custom report to supplement standard reports providing the Customer a breakdown per Cloud Provider Account or based around a custom tag specified. For example, Cost Center, Project or by Owner. Cloudreach shall clarify Customer reporting requirements on the initial onboarding call. This custom report can provide:

- A monthly cost to date and a comparison to last month at the same time;
- Projected monthly cost and a comparison to last month.
- A breakdown of projected costs based around a custom tag.
- A historical monthly cost allocation based around the tag.

These reports will be sent by [cloud@cloudhealthtech.com](mailto:cloud@cloudhealthtech.com), an email address that may require inclusion on Customer's company whitelist to ensure they are not marked as spam.

## Delivery and Frequency

The frequency of these reports, by default, will be setup to be delivered once a week. Cloudreach shall adjust the frequency upon request.

Whilst the reports will hyperlink to the Cloudreach Billing Dashboard, access to the Dashboard is restricted to customers of Cloudreach's Cost Management Products; for example Cost Control. For more information on these products, please speak to your Cloudreach Account Manager.

## Email Alerts

In addition to the two email reports outlined above, Cloudreach shall setup a single email alert based on three thresholds:

- When Customer Actual Costs are higher than 80% of the specified budget;
- When Customer Actual Costs are higher than 95% of the specified budget;
- When Customer Actual Costs are higher than 100% of the specified budget.

These alert will run every day. For these email alerts, the Customer shall share with Cloudreach required budgets, either an annual budget or per month. Where a budget is not specified, these alerts will be configured against Customer prior usage.

## Additional Email Alerts, Cost and Usage Reports and Billing Support

For any additional reports or billing support, please contact the Cloudreach Service Desk at the first instance.

The number of additional custom reports will be limited to five in total. These custom reports can be re-configured, but no more than five will be delivered consecutively. Additional alerts, configured based around custom requirements, are only offered as part of our Cost Management Products.

# Cloud Provider Account Provisioning

Whilst there are automation capabilities for provisioning Cloud Provider Accounts, there are still manual steps that are required resulting in additional administrative burden to the Customer's internal teams. To allow Customers to focus on their core business and on-going innovations, Cloudreach can instead take on the responsibility for the account setup and configuration.

For new a Cloud Provider Account provision, Customer shall complete the Cloudreach Account Provisioning Request Form and raise a ticket with our Support Team, as outlined in the [Support](#) section. After a request is received, Cloudreach shall provision a new Cloud Provider Account under the specified CSP Billing Account.

For **AWS**, Cloudreach shall provide the Customer with **either**:

- AWS root credentials for the new Linked Account, or
- Access to the new Linked Account via CSP IAM capabilities.

For **Azure**, Cloudreach shall provide the Customer with:

- Access to the new Azure Subscription via CSP IAM capabilities.

For **GCP**, Cloudreach shall provide the Customer with **either**:

- GCP Project ownership privileges, or
- Access to the new GCP Project via CSP IAM capabilities.

At the Customer's request, Cloudreach shall apply mutually agreed configuration steps to the Provider Account at the time of provisioning. These help the Customer comply with best practices and adhere to common governance requirements. It is encouraged that these steps should happen as early as possible in the Provider Account lifecycle, before any other resources are set up.

The configuration steps may include but are not limited to:

- **Billing and Account Administration** - Cloudreach can assist with the administration of adding a new Cloud Provider Account to your billing hierarchy. For example, AWS and Microsoft Azure determines the tax applicable based on the location of the Cloud Provider Account and Google GCP based on the Billing Account (via the address details specified). Cloudreach can assist with the registration of tax (e.g. VAT) exemptions, updating and maintaining the registered address for each Cloud Provider Account or Billing Account and the management and ongoing maintenance of multi-factor authentication and the handling of root credentials.
- **Identity and Access Management of Users** - During the Provider Account provisioning process, Cloudreach can setup user access to each Provider Account, incorporating controls and governance to ensure against provisioning unfettered access to all users. This can include setting up the permissions necessary for third-party tools.

- **Auditing, Logging and Compliance** - Cloudreach shall ensure that the account is setup according to Customer's audit, logging and compliance requirements. For example, setting up AWS CloudTrail, AWS Config, Azure Activity Logs or GCP Audit Logs.

## Cloud Commercial Terms [AWS-ONLY]

As an approved reseller of AWS, Cloudreach leverages its experience and expertise in public cloud services to offer enhanced value and better protection for Customers that Customers may not be able to obtain elsewhere. These enhanced value adds include:

- **Enhanced Notification Periods:** Cloudreach provides longer notification periods for Customers to allow Customer as much time as possible to make alternative arrangements. These include:
  - Extended notice period of 60 days for any AWS price increases
  - Extended notice period of 12 months if AWS discontinues a AWS service
  - Extended notice period of 24 months if AWS terminates the AWS resale for convenience
- **Extended Retrieval Period Post-Termination:** Cloudreach will provide an extended period of 90 days from termination for Customer to access and retrieve its data and content from AWS.
- **Additional support for compliance requirements:** Cloudreach can assist and support Customer with any law or regulation compliance requirements in respect of the use of AWS as requested by Customer's regulator. Cloudreach can utilise it's direct communication channels with AWS to assist Customer in obtaining relevant compliance information, documentation or assistance as required by Customer.

## Cloud Technical Support [AWS and AZURE ONLY]

A requirement mandated by CSPs is that the Customer select a Support Option for their Cloud Provider Accounts. The Customer shall notify Cloudreach the chosen "Support Option" for each CSP.

The Customer shall notify Cloudreach the chosen Support Option and it is to be noted on the Order Form. Cloudreach shall invoice the Customer on behalf of the CSP for the Support Option, excluding Cloudreach-led Advanced Azure Support, for charges incurred by the Customer as communicated by the CSP.

### Cloudreach-led Technical Support

Unless otherwise agreed, your technical support will include the following:

- Development and Production issues for CSP products and services along with other key stack components;
- "How to" questions about CSP products and services;
- Best practices to help you successfully integrate, deploy, and manage applications in the cloud;
- Troubleshooting API and AWS SDK issues;
- Troubleshooting operational or systemic problems with CSP resources;
- Issues with the AWS Management Console, Azure Portal or other AWS or Azure tools;
- Problems detected by CSP health checks;
- Advice on a number of third-party applications such as OS, web servers, email, VPN, databases, and storage configuration.

Unless otherwise agreed, this Support does not include:

- Any software and services running on your CSP infrastructure not mentioned above;
- Code development;
- Debugging custom software;
- Performing system administration tasks.

As well as mirroring the SLA Response and Resolution times of the CSPs, Cloudreach shall provide the Customer the ability to raise a case by [Email](#), over the Phone, or using our [Support Portal](#). More information can be found in the [Support](#) section.

Cloudreach have a priority escalation channel as a **Top-tier Partner** of both AWS and Azure, therefore

the Customer will receive support faster, particularly when Cloudreach have to escalate any issues to the CSP.



# Architectural and Application Optimisation

## (Included only in Premium Tier/Plan)

Cloudreach recognises, based on their pedigree of delivering solutions in native Public Cloud, opportunities exist to intelligently deliver cost management principles at the architectural and application-level. By applying best practice principles at this technical level, Cloudreach provides another mechanism to maintain cost management of Cloud spend.

Cloudreach will, as part of the monthly service reviews in our Premium tier of Cost Control, provide guidance and recommendations on what improvements can be introduced to help drive architectural cost efficiencies as usage grows.

- Reviews are performed by both our Cost Control team and Operations Engineering teams which offer expertise in application modernisation, DevOps and SRE;
- Recommendations on how to re-architect to ensure a cost efficient cloud environment will be discussed with the customers relevant financial and technical stakeholders;
- The customer has the option to purchase additional Operations Engineering days to implement recommendations;
- At the end of each month, we will provide the recommendations and if requested, we can implement the changes.

This service is bundled with the Premium plan of Cost Control. For each tier, the specification is as follows:

As part of this improvement service, Cloudreach, upon agreement of work with customer, will:

- Perform an assessment of customer application, architecture and environment. The purpose of these sessions will be to gather both business and technical requirements of the application;
- Cloudreach will perform analysis of the findings and produce a “Level of Effort” report which will include a proposal of changes to be carried out, together with estimation of cost saving;
- Cloudreach will work with customer application teams to implement the identified recommendations.

Cloudreach will usually take following approaches to cost optimisation:

- **Appropriate provisioning** - Using tools such as CloudWatch to monitor capacity behind the resources, then implementing changes which ensure that excess capacity is kept to a minimum while performance is maximised for end users;
- **Right sizing** - an iterative process, triggered by changes in usage pattern or external factors (i.e. new resource types on offer from vendor);
- **Purchasing options** - through thorough understanding of the application and long-term business requirements, Cloudreach will be able to suggest and implement a cost-effective model of utilising on demand vs spot vs reserved resource types where appropriate. Cloudreach may for example make some technical changes to the application which will allow use of

cost-saving spot instances;

- **Move to PAAS services** - Cloudreach recognises that the use of PAAS services significantly increases reliability of the service, as well as reduces the cost of management of the infrastructure behind the service. Within this service, Cloudreach can help customer move the resources historically hosted on compute infrastructure onto PAAS service. A simple example can be a database running on an EC2 instance, which Cloudreach can help move to RDS;
- **Data transfer optimisations** - Cloudreach can help with optimising data transfer costs within the application. Examples of such work may be planning and moving the resources between and within regions to ensure reduced data transfer costs between services, as well as introducing AWS CloudFront for more cost-efficient delivery of static content to end users globally;
- **Matching supply with demand** - matching end user demand for the application with one of the three supply strategies: demand-based, buffer-based or time-based.
  - Demand-based strategy leverages the elasticity of the cloud, through use of e.g. auto-scaling groups, to measure and meet the demand of end users, resulting in horizontal scaling of the application according to the needs. Cloudreach can implement or make improvements to demand-based strategy by implementing or altering the scaling thresholds, as well as improving the application build process to i.e. reduce the amount of time until the application is ready to serve traffic (by i.e. making changes to AMI bakery and application bootup process);
  - With Buffer-based strategy Cloudreach can help decouple the producers from consumers within the application, by introducing a buffering solution such as Amazon SQS. This approach can help in optimising the cost of an application that relies on heavy processing of data, where a delay in data processing is an acceptable business outcome. Depending on the business objectives, the cost of data can be then reduced by a number of further implementations, i.e. limiting the amount of consumers/processors of data, only processing data when spot instance price is low, or implementing a scalable approach to data processing depending on the length of the processing queue;
  - Cloudreach can help implementing time-based scaling triggers which align resource capacity to predictable demand throughout the day, month or year.

The Cloudreach resources and improvement activities are time limited to the number of Architectural & Application Days as set out in Appendix A. Cloudreach shall use reasonable endeavours to work towards performing some improvement activities as agreed with the Customer during such days.

## Optimising over time

As Cloud Providers release new services and new generations of their compute resources, customer applications can reap further cost optimisation improvements by “staying ever green”. Cloudreach, through its premier relationships with CSP vendors, is continuously assessing and evaluating newest services and generations of compute infrastructure. As part of this service, Cloudreach will continuously re-evaluate customer applications against the newly released services from CSP’s, and will always consider to move the resources to the newest services, features, and instance types.

## Example case studies:

- Optimising data replication of splunk cluster and introducing horizontal scaling of indexers and search heads;
- Move Elasticsearch cluster hosted on EC2 instances to ElasticSearch service;
- Decoupling of “processing” workers behind custom application, introducing buffer-based approach to application scalability and cost reductions through use of stateless EC2 spot fleet to reduce the cost of the job processing;
- Improvements to a video streaming web app (improvements in build process to reduce boot time, introduction of autoscaling to provide cost-efficient scalable solution.

# Cost Control: Cloud Vendors Coverage

	AWS	Azure	GCP
<b>Financial Governance and Accountability</b> <i>Established governance, ownership, tagging policies, aided with monitoring and automation.</i>	✓	✓ (excludes automated tagging)	✓ (excludes automated tagging)
<b>Reporting and Data Visualisation</b> <i>Reports, dashboards and visualisation of the enterprise cloud spend.</i>	✓	✓	✓
<b>Cost Optimisation</b> <i>Continuously identifying cost optimisation opportunities and ensuring they are executed to ensure tangible cost savings.</i>	✓	✓	✓ (alpha release)
<b>Procurement Support</b> <i>Procurement and finance support including: Custom invoicing, Enterprise Discount planning, volume discount purchasing, budget tracking, converting CSP credit into services and much more</i>	✓	✓	✓
<b>Architecture and Application Optimisation reviews</b> <i>Delivery manager coordinates access to Cloudreach experts who will work with the customer to analyse and make recommendations to optimise the architecture and applications cost.</i>	✓	✓	--- (Roadmap)

# Onboarding Process

## Workshop

In order to commence Onboarding, the Cost Control Delivery Team will conduct one remote/virtual billing workshop (the **“Onboarding Workshop”**). This Onboarding Workshop will:

- SLA - 5 working days
- Gather information necessary from the Customer for the setup of Cost Control using the Information Gathering Documentation;
- Provide basic information on the key concepts of public cloud billing and financial optimisation to key Customer stakeholders;
- Provide information on how to access the Cloudreach Operations Team, including the Cost Control Delivery Team;
- Provide an overview to the Onboarding process, including agreement with Customer on the timeframe for Onboarding;
- Give the Customer the opportunity to ask Cloudreach any questions regarding the initiation of Cost Control.

## Billing and Financial Optimisation Manual

Following the delivery of Onboarding, the Cost Control Delivery Team will capture the Customer's answers and produce a **“Billing and Financial Optimisation Manual”**. This will capture all information provided to Cloudreach during Onboarding, including a brief summary of key concepts of public cloud billing and financial optimisation.

Should the Customer wish to make any customisations (e.g. additional reporting, cloud resource scheduling rules, etc) these must be made in writing to the Cost Control Delivery Team. The Cost Control Delivery Team will review customisation requests and if approved, will capture the requests in the Billing and Financial Optimisation Manual. Upon implementation of the customisation requests, the changes will be recorded in the Customer's corresponding Customer **“Change Log”**.

# Support

The Cost Control Service is supported by a team of dedicated billing and cost optimisation experts (**"Cost Control Delivery team"**) to assist with queries and service customisation all delivered under a Service Level Agreement (SLA).

The Cost Control Delivery Team is accessible via the Cloudreach Support Desk.

The Cost Control Delivery Team shall:

- Configure a series of standard reports following Onboarding, which will be supplied to the Customer by email or accessible via a Billing Dashboard;
- Provide reactive assistance, with an SLA (as detailed below) in the configuration of custom reports;
- Provide reactive support, with an SLA (as detailed below), to answer any billing or financial optimisation queries;
- Provide proactive management of Customer's Cloud environment through preparing a report for monthly reviews. These reviews will encompass both a summary of usage over the preceding billing period and optimisation and accountability recommendations as set out in this Service Specification;
- Manage the configuration of a Billing Dashboard for the Customer.;
- Assist with the training of a Billing Dashboard or "Web Portal", which provides key Customer stakeholders with visibility of their public cloud usage in real time and the ability to access and export all billing reports.;
- Manage the administration of Customer's AWS account(s) including provisioning new AWS accounts; bringing existing AWS accounts under Cloudreach's master account; and purchasing Reserved Instances at Customer's request.

If Customer wishes to seek the assistance of the Cost Control Delivery Team, such assistance will be provided in accordance with the SLA set out below.

## Service Level and Multi-Language Support

All Incidents and support requests raised and logged with the CSD and Cost Control Delivery Team in the appropriate manner, will be processed pursuant to this section.

### Incident Prioritisation

The Customer shall, acting in good faith and using good commercial business sense, categorise any issue affecting the availability or performance of Cost Control or support request (“**Incidents**”) as P1, P2, P3, P4 or P5 (as defined in table below). Incidents should be raised as a “Billing and Optimisation Support Request” to the CSD in order to direct the requests to the appropriate team effectively.

Priority Level	Cost Control Examples of Cost Control Specific Issues
P1	<ul style="list-style-type: none"> <li>• Invoices or billing reports not received.</li> <li>• Optimisation reports and recommendations not received.</li> </ul>
P2	<ul style="list-style-type: none"> <li>• Daily reports are not available for viewing.</li> <li>• Automated tagging service not functioning.</li> </ul>
P3	<ul style="list-style-type: none"> <li>• Unable to access the Cost Control portal.</li> <li>• Cost Control portal is not working as expected (visible errors, incorrect data, etc).</li> </ul>
P4	<ul style="list-style-type: none"> <li>• Query related to content of an invoice or billing report.</li> <li>• Changes to product configuration items like Invoice Groups, Budget Alarms, Financial Management and Optimisation queries and implementation</li> <li>• Request for account provisioning</li> </ul>
P5	<ul style="list-style-type: none"> <li>• General technical guidance provided to the Customer</li> </ul>

### Incident Management

Cloudreach shall, acting in good faith and using good commercial business sense, respond to Incidents raised by the Customer according to the steps detailed below:

- All Incidents raised by Customer will be logged with Cloudreach and will be categorised as per the Priority supplied by the Customer. In the event that Cloudreach determines, in its sole discretion, that the categorisation of an Incident is incorrect, Cloudreach will re-categorise the Incident and notify the Customer.
- Cost Control availability:
  - The CSD and the Cost Control Delivery Team can assist with and provide support for Incidents during Business Hours only.
  - Notwithstanding the above, Customer may contact and log an Incident with Cloudreach at any time;
- For all Incidents except P1, an Incident can be logged with the CSD either through:
  - (i) the web by logging in to support.cloudreach.com using login details provided by Cloudreach; or
  - (ii) calling [UK] 0800 612 2966, [Overseas] +44 207 183 3991 or [US/Canada] (212) 335-0700;

- For P1 Incidents only, Incidents shall be logged by telephone only by calling UK 0800 612 2966 or +44 207 183 3991 if overseas. P1 Incidents cannot be logged online;
- Customer shall only access and log Incidents through the CSD and the Cost Control Delivery Team through a designated Customer employee(s) ("**Customer Personnel**");
- When logging an Incident, Customer will provide the following diagnostic information:
  - Detailed description of the issue;
  - Customer Incident number (if applicable);
  - If available and reproducible, step by step instructions to reproduce the reported Incident;
  - If available, date and time (and timezone) when Incident occurred.
- Cloudreach is under no obligation to respond to requests made in a manner that does not comply with the process set out in this section and in accordance with the order form (if applicable).

### Response Times

The table below shows the target response times for each Incident priority. "**Response**" is defined as Cloudreach acknowledging the Incident by providing a reference number either electronically or verbally to the Customer as documented by Cloudreach. CSD and/or the Cost Control Delivery Team will use commercially reasonable endeavours to find a solution or a workaround to the Incident.

Priority	Target Response Time (during Business Hours)
P1	15 minutes
P2	1 hour
P3	4 hours
P4	8 hours
P5	1 Day

### Customer Responsibilities

Customer shall:

- Provide a list of Customer Personnel who will have access to CSD and the Cost Control Delivery Team. Customer is responsible for keeping the list accurate and up to date.;
- Log an Incident in the manner prescribed above in order to receive support;
- Following the logging of an Incident, Customer shall be available via email or telephone to answer questions and assist the CSD and/or the Cost Control Delivery Team as appropriate;
- Provide telephone or email access to the end users to facilitate troubleshooting Incidents;
- In a timely manner, provide access to such personnel and resources as required to allow Cloudreach to provide Cost Control including without limitation: programmatic access to AWS detailed billing data as required by Cloudreach for performance of Cost Control.



# Product Development

Customer acknowledges and agrees that Cloudreach continually invests in enhancing its product offerings and therefore reserves the right to change these Service Specifications at any time provided always that changes to the Service Specifications shall be notified to the Customer as determined in an order form.

## Change Log

Date	Author	Description
21/2/2019	Asad Malik	V1.0 created
05/03/2019	Asad Malik	V2.0 update

## Appendix A - Soft Limits

Service	Limit	
<b>Onboarding Workshops</b>	1 three hour session delivered remotely/virtually.	
<b>Training sessions on the Billing Dashboard.</b> Additional training sessions can be delivered upon mutual agreement between the Customer and Cloudreach and may be subject to additional charges.	6 one hour sessions.	
<b>Billing Dashboard User Accounts.</b> Additional User Accounts can be delivered upon mutual agreement between the Customer and Cloudreach and may be subject to additional charges.	30	
<b>Monthly Reviews</b>	1 to be delivered remotely/virtually - this will be scheduled subject to the finalisation of usage and billing data provided by the Cloud Provider.	
<b>Architectural &amp; Application Days included with Cost Control Premium (per band)</b>	<b>Monthly Spend (USD) Band (per month in a given month)</b>	<b>Bundled Architecture Optimisation days (per month)</b>
	\$0k-\$50k \$50k-100k \$100k-250k \$250k-500k >\$500k	1 day 2 days 3 days 4 days 5 days
<b>Provider Accounts</b> , not including AWS Master Billing Accounts. Additional Provider Accounts shall be mutually agreed between the parties subject to the charges in an order form.	50	
<b>Budget Alarms.</b> Additional Budget Alarms shall be mutually agreed between the parties subject to the charges in an order form.	15	
Additional custom <b>Billing and Financial Optimisation Reports</b> prepared by the Cost Control Delivery team. Additional reports shall be mutually agreed between the parties subject to the charges in an order form.	5 reports per month via the Billing Dashboard	

<p><b>Cloud Resource Scheduling rules.</b> Additional Cloud Resource Scheduling rules shall be mutually agreed between the parties subject to the charges in an order form.</p>	<p>5</p>
<p><b>Tag Alerting Schedules.</b> Additional Tag Alerting Schedules shall be mutually agreed between the parties subject to the charges in an order form.</p>	<p>5</p>