



Database Support

Service Specification

Service Specification

Service Name:	Database Support
Service Level Hours:	Refer to section 1.0
Unit of Charge:	Fixed fee based on support considerations
Prerequisites:	Refer to Deployment Documents Infrastructure Reliability
Supported Cloud Platforms & Database Engines	Oracle, MySQL, MSSQL, PostgreSQL
Product Codes:	CO-DATABASE-SUPPORT
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The Small Print

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Definitions

The definitions for all capitalised terms used throughout this Service Specification are set out in the Cloud Operations Service Definitions document which forms a part of this Service Specification and the Cloudreach Order Form to which this Service Specification relates.

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1. Service Overview

Database Support is a managed service for Oracle, MySQL, MSSQL & PostgreSQL database engines. The service will manage the availability and accessibility of the supported engines hosted within AWS, Azure and GCP. It will provide operational support services around administration, monitoring, configuration & maintenance on a 9x5 or 24x7 basis.

A summary of the key features of database support are listed below:

[Onboarding](#) - Cloudreach will assign a Service Transition team member to manage the project of onboarding Customer environment into database support. During the initial phase of onboarding, Cloudreach will assess the time needed to onboard the environment based on the complexity and intricacies involved with onboarding. Please note that Cloudreach will only perform onboarding of Customers Environments during Business Hours.

[Monitoring](#) - The service will monitor the availability and accessibility of the Customer's database instances running on top of IaaS services within the Customer environment. The performance metrics will also be collected to detect trends with defined thresholds for alerting and performance analysis.

[Performance Optimisation](#) - Based upon incident trends and monitoring data, Cloudreach will analyse database instance performance to support in making recommendations and implementing changes linked to optimisation initiatives.

[Backups and Restore](#) - Cloudreach will provide management support for database specific backup configuration on pre-agreed schedules & support in the recovery of data.

[Administration](#) - Cloudreach will provide 9x5 database administration including activities related to user management, instance configuration, data & maintenance management.

1.1 Service Levels

Services	Service Level Hours
Onboarding Administration Performance Optimisation	Business Hours (9x5) <i>(PDT time zone if the Customer is based in NA and GMT time zone if the Customer is based in EEA)</i>
Monitoring Backup and Restore	24x7

2. Database Engines Supported

Cloudreach supports the following Database Engines:

Database Engine	Comment
Oracle	Currently support covers Oracle 11gR2 and later.
MySQL	Currently support covers MySQL version 5.7 and later.
MSSQL	Currently support covers MSSQL 2012 and later.
PostgreSQL	Currently support covers PostgreSQL version 9.5 and later.

2.1 LTS version support

Cloudreach may require to update & test the set of tooling to ensure that it works as expected with new versions of Databases. For that reason, at times, Cloudreach may not be able to support new LTS versions of Databases as soon as they are released.

In the case of vendors making changes that require Cloudreach to adjust the tooling, Cloudreach reserves the right to take up to 6 months to make all necessary changes to support new LTS releases.

With regards to Database end of support, Cloudreach will provide support until such date or extension thereof, from the Database vendors.

3. Onboarding

3.1 Onboarding Terms

Once the service is ready for onboarding, Cloudreach will assign a Service Transition team member to manage the project of onboarding Customer environment into Database Support.

During the initial phase of onboarding, Cloudreach will assess the time needed to onboard the environment based on the complexity and intricacies involved with onboarding.

Please note that Cloudreach will only perform onboarding of Customer's Environments during Business Hours.

3.2 Deployment Strategy

In order to deliver the Database Support service, Cloudreach needs to have access to the Customer's Environment(s) in the form of the following:

Identity & Access Management

- Write permissions to designated object storage buckets for backups & monitoring data.
- CSP monitoring service read/write access to view Metrics, Log Groups & Alerts.
- CSP notification service access to configure notification alerts direct to responsible members of the database support team.
- CSP analytics service access to perform trend analysis of data stored within the associated object storage buckets.

The relevant Cloudreach CSP role will be attached to instances and associated Functions which are used for monitoring and writing data to storage buckets and monitoring platform.

System Administrator Access

- With access to the relevant hosting servers
 - non root user ID designated for database access regarding Oracle, PostgreSQL & MySQL
 - non local or domain administrator level user for database access regarding MSSQL
- And for access to the relevant database management software installed on the hosting server.

This enables Cloudreach's database support teams to provide the various management services within the Customer's Environment where configuration, maintenance, troubleshooting and service management are required.

3.3 Database Provisioning

Where the client has a defined provisioning process & supporting runbook for database engine installation and/or database instance provisioning and configuration Cloudreach can provide support as a P4 level request.

- An example of this type of request would include installing the MSSQL database engine services and configuring database instances through the management software manually, or configuring this service to be automatically deployed and configured through bootstrapping or IaC deployments.

3.4 List of Tools installed into Compute Resources

Cloudreach, as part of delivery of Database Support service, will make use of the agents installed as part of the pre-existing Infrastructure Management service.

- Additionally, Cloudreach's database support team is able to use other 3rd party monitoring tools/agents the Client's teams have installed.

Cloudreach reserves the right to change or add tools to customer VM's. Customers will be notified of any changes made to the list above in advance.

3.4.1 Tool Maintenance

It is the responsibility of Cloudreach to install and maintain the version and configuration of tools installed by Cloudreach on Customer's Virtual Machines.

Unless otherwise agreed by Cloudreach, Customer shall not alter the tools installed and configured by Cloudreach, as any changes made may result with impact on the service that Cloudreach can provide.

4. Monitoring

Cloudreach will monitor the availability, performance & system resource utilisation of all database instances under support for each mutually agreed AWS, Azure and/or GCP Account and can raise an alert based on the event conditions denoted during Onboarding Process.

In the event that an alert is raised, Cloudreach shall:

- Manage the response to the alert pursuant to the Incident Management Process.
- Send the alert based on the event conditions as an email to the Primary Contact as denoted during the Onboarding process.

4.1 Monitoring Methodology

4.1.1 Data Residency

All monitoring data collected by Cloudreach's database support team will be stored within the client network, inside of an associated object storage bucket.

4.1.2 Data Collection

For CSP native monitoring services (i.e. AWS CloudWatch), data will be collected from the external 3rd party tooling providers specified in 4.2.2.1 via API requests to the appropriate CSP service. As part of the onboarding process, a service account role and relevant permissions will need to be created in Customer environments to allow this collection.

For OS-level collection of data, an agent will be installed on the operating system. The agent will report metrics to an external endpoint, either directly or via proxy.

Frequency of collection is configurable, with default being every 5 minutes. Over time, older data might be aggregated for performance reasons.

4.1.3 Data Retention

Monitoring data will be retained for 6 months.

4.2 Scope of "Supported" and "Monitored"

This section provides an explanation of what Cloudreach means in relation to supporting and monitoring database engines.

4.2.1 Scope of “Supported”

4.2.1.1 Best Practice Guidance

Cloudreach holds expert level knowledge of this service and leverages this to provide guidance and advice to Customers. Engineers will be able to advise Customer on changes to the service that are inline with the best practice guidelines provided by the vendor and discuss details and intricacies of the service with customers.

4.2.1.2 Configuration Management

Cloudreach will perform changes at a database instance level, manually through remote access or automatically using pre-built management tools to execute the change. The focus of any changes to be carried out will be to either maintain or improve health, availability or accessibility of the resource/service. As well as provide configuration changes connected with the data inside the database (i.e. altering tables, modifying data, creating SQL users)

4.2.1.2.1 Out of Scope: Configuration Management

Please note that within the Database Support service, Cloudreach will only perform database instance-level support and will not provide application-level administration.

4.2.1.3 Service Troubleshooting

Cloudreach will assist Customers with troubleshooting issues with the service at a database instance level, with the focus of providing availability and accessibility of all databases within supported customer environments.

An example of an issue, where Cloudreach can assist, could be where a session within an Oracle database holds an exclusive lock on an object. If this were to persist for an extended period of time an alert would trigger, and an engineer would manually or automatically access the relevant resource to force a release.

4.2.2 Scope of “Monitored”

4.2.2.1 Service Monitoring

Cloudreach is utilising the following services to collect monitoring Data:

- Logs shipped to CSP monitoring service from Virtual Machines
- Database level metrics & rulesets captured through cloud native function invocations
- Scheduled jobs states executed by database agents
- Performance data captured through execution queries against system tables

The data collection method will be configured by the database engine included under support. Where the monitoring data gathered will typically include:

- Blocked Queries
- Query CPU Consumption
- Query Memory Consumption
- I/O Bottlenecks
- # of Concurrent Sessions
- Session Details
- Sessions active for > 24 hrs
- Longest running transactions

- Job Status (Application Jobs and Backups)
- Database/Log Space Utilized
- Temp Space Available

During onboarding, Cloudreach will discuss and agree on monitoring methodology with the Customer. Cloudreach will configure the monitoring alerts to the needs of the Customer environment(s), focusing on monitoring key components which indicate that the platform is available and accessible.

Once onboarding is completed, Cloudreach monitoring software will monitor the Customer environment(s). Cloudreach will receive notifications and investigate events in accordance with the defined monitoring alerting. If appropriate, Cloudreach will raise a support case and contact the Customer primary contact(s) to inform them of the details of the support case.

Cloudreach reserves the right to disable or modify a specific monitoring or alerting configuration on notice to the Customer, if deemed necessary by Cloudreach in order to preserve an accurate and effective alerting signal.

5. Performance Optimisation

Cloudreach shall perform the following performance optimisation activities in line with the delivery of database support.

Type	Comment
Instance/Database Tuning	Support with diagnosing and repairing SQL statements that fail to meet a performance standard.
Query Optimization	Investigating inefficient queries based upon performance data and providing support with implementing query optimisation strategies.
Trend Analysis	Proactive review of stored monitoring data towards identifying improvement opportunities within the respective database instances.

5.1 Scope of Performance Optimisation

For avoidance of doubt, Database Support will not cover any performance optimisation tasks beyond the databases covered within this service.

6. Backup and Restore

6.1 Backup Configuration & Implementation

Cloudreach shall perform daily, weekly and monthly backups of the database Instances based on an established configuration within the customer environment.

- If required Cloudreach can provide support for appropriate backup configuration and scheduling as part of this service

- With regards to Recovery Point Objective (RPO), Cloudreach is able to adjust backup schedule to accommodate variations required by the Customer as well as to adjust data retention policies to optimise storage commitments
- With regards to Recovery Time Objective (RTO), Cloudreach is unable to provide a generic assertion of how long it will take to restore a database. This is due to a number of factors which are unique to each application and environment (i.e. database size, application intricacies).

Database Technology	Full Backup	Differential	Transactional	RPO	Default Retention
AWS					
Oracle	Weekly	Nightly	Hourly	1 hour	1 week
MySQL	Weekly	Nightly	Hourly	1 hour	1 week
MSSQL	Weekly	Nightly	Hourly	1 hour	1 week
PostgreSQL	Weekly	Nightly	Hourly	1 hour	1 week

6.2 Backup Monitoring & Validation

Cloudreach shall monitor all backup processes to ensure consistency and compliance with agreed restoration plans.

- Deviations to the agreed backup schedule or restoration plan should be raised in advance with the database support team

6.3 Recovery

Instances of databases can be restored upon request by the Customer based on the approach agreed between both the customer and the database support team.

- All restoration activities owned by Cloudreach must be fully documented and tested before ownership is transferred
- All requests raised by the Customer that are not identified as service impacting will be treated as P4 Service Requests.

7. Administration

Cloudreach will provide support for database administration on request by the client as part of this service.

The following table outlines all activities that may be raised by the client team with regards to administration:

- Cloudreach shall respond to the administration request types in accordance with the service levels outlined within the Infrastructure Reliability prerequisite Service.

Request Type	Scope	Priority
User Management	Managing user access & permissions as well as on-boarding and off-boarding users from database instances.	P3
Schema Management	RDBMS tasks related to adjustments in the existing design or structure of supported databases.	P3
Configuration Management	Requests handling maintaining consistency of database instance performance and changes to associated attributes.	P3
Data Refresh	Refresh of designated primary databases with secondary or alternate sources.	P3
Data Cloning	Support with capture and preparation of database clones.	P4
Data Migration	Support with migration of data sets between instances within existing database installations.	P4
Version Upgrades	Support moving from existing to newer versions of database engines.	P4
Patch Management	Support applying vendor patches to existing database engines.	P4

8 Services Management Support

Cloudreach will provide maintenance, troubleshooting, support and service management to ensure the availability and accessibility of the Customer’s database(s) in the Public Cloud. This section covers the service management Cloudreach will provide to the Customers as part of Database Support.

8.1 Incident Management

8.1.1 Incident Management Guidelines

8.1.1.1 Cloudreach Responsibilities

Cloudreach shall adhere to the following guidelines as part of the Incident Management Process:

- All Incidents raised by Customer will be logged with Cloudreach and will be categorised as per the Priority table below (see “Incident Prioritisation” tables below)
 - The CSD can be accessed on a 24/7 basis to assist with P1 and P2 Incidents relating to the Customer Cloud Platform and troubleshooting issues in the manner set out below. An Incident can be logged by the Customer or Cloudreach either through:
 - (i) emailing Cloudreach at support@cloudreach.com;

- (ii) calling [UK] 0800 612 2966, [Overseas] +44 207 183 3991 or [US/Canada] (212) 335-0700;
 - (iii) the web by logging in to support.cloudreach.com using login details provided by Cloudreach during the onboarding process; or
 - (iv) mutually agreed automated event process.
- For P1 Incidents specifically, the CSD can be accessed on a 24/7 basis only by telephone through the numbers as set out above. For the avoidance of doubt, P1 Incidents cannot be raised by email or through the CSD web portal.
- Customer can access CSD only by a designated Customer employee ("Support Engineer") raising an Incident.
 - Cloudreach is under no obligation to respond to Incidents made in a manner which does not comply with this section.
 - CSD will use reasonable endeavours to find a work-around or solution to the Incident.

8.1.1.2 Customer Responsibilities

- Incidents must be logged by Customer in accordance with this section.
- When logging an Incident, Customer will provide to Cloudreach the following diagnostic information:
 - Detailed description of the issue
 - Customer Incident number
 - If available and reproducible, step by step instructions to reproduce the reported Incident
 - If available, date and time (and timezone) when Incident occurred
- Following the logging of an Incident, Customer shall be available via email or telephone to answer questions and assist the CSD as appropriate.
- Customer shall provide telephone or email access to the End User to facilitate troubleshooting Incidents.
- Customer shall provide access to End User support tools or permit Cloudreach to use their support tools to facilitate troubleshooting Incidents.
- Customer shall, within 5 working days of a request from Cloudreach, provide CSD staff access to all required Customer systems in order to enable Cloudreach to provide the Services detailed in the Order Form.

8.1.2 Incident Prioritization

The following tables outline the prioritization of Incidents and the description of each Priority Level.

Priority Level	Type of issue
P1 - Critical Impact	Total loss of service, no workaround available.
P2 - High Impact	Functional but degraded critical service or total loss for a service which supports a critical service. No work around available.
P3 - Medium Impact	Non critical service which is partially impacted and not functioning as intended. Or high priority Administration request

P4 - Low Impact	<p>Minor issue contained to a small group. A work around or alternative service is available.</p> <p>Or low priority Administration request</p>
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8.1.3 Incident Response and Resolution Times

The table below shows the response and resolution times for each Incident Priority. For the purpose of this clause:

- “Response” is defined as Cloudreach acknowledging the Incident by (i) providing a Cloudreach reference number either electronically or verbally to the Customer and (ii) assigning a priority to the Incident.
- “Resolution” is defined as Cloudreach providing a reasonable workaround or solution to the Incident.
- The time for Resolution starts at the same time as the Response time.
- SLA for Response and Resolution times start ticking when an Incident is logged by a Customer (either by phone, email or through the CSD web portal) or when Cloudreach is alerted of a service impact via its monitoring system.

Priority	Target Response Time	Target Resolution Time
P1	15 mins (24x7)	4 hours (24x7)
P2	15 mins (24x7)	12 hours (24x7)
P3	30 mins (9x5)	24 hours (9x5)
P4	2 hours (9x5)	3 Business Days (9x5)
P5	4 hours	Reasonable endeavours

8.2 IT Change Management

8.2.1 Cloudreach responsibilities

- Cloudreach shall use reasonable endeavours to agree the IT Change Management process with the Customer;
- Cloudreach will only implement Change Requests to the Customer Cloud Platform which are in accordance with the IT Change Management process;
- Cloudreach shall only provide Customer with the credentials required to access the Customer Cloud Platform to complete work authorised through the IT Change Management process

8.2.2 Customer responsibilities

- Customer shall log all required changes made to the Customer Cloud Platform with Cloudreach using the mutually agreed IT Change Management Process;
- Customer shall provide Cloudreach with all necessary Public Cloud Environment and Private Cloud Environment services requested by Cloudreach in order to effect the Change Requests in accordance with the IT Change Management Process

8.3 Monthly Service Reporting

The SDM will conduct and chair a monthly service review meeting with the Customer at a time and place to be mutually agreed in advance by the parties. The agenda for the service review shall include:

- Review service report management summary and discuss any points including but not limited to Cloudreach or Customer actions;
- Review Incidents, Problem(s), and Change Request(s) records, review performance and capacity issues identified (if applicable);
- Review status of existing, and any new mutually agreed, service improvement(s);
- Make recommendations for improvements of the service which have been identified by Operations team

8.3.1 Service Reports

Cloudreach shall provide Customer with a monthly service report in Google Docs format or PDF . The monthly service report shall include:

8.3.1.1 Management Summary

- Amazon Web Services (AWS) and Microsoft Azure performance summary: overall status plus availability and performance concerns, if any, on managed resources;
- AWS and Azure security: overall status plus any security concerns, if any, on managed resources;
- Instance backups: overall status plus any business continuity concerns

8.3.1.2 Service Management

- Incident record summary including:
 - Current open Incident records and/or Service Requests
 - Recently closed Incident records and/or Service Requests
 - Summary of Incidents by priority and/or Service Requests
 - Summary of Incidents by component and/or Service Requests
- Problem record summary:
 - Current open problem records
 - Recently closed problem records
- Change Request record summary:
 - Pending Change Requests
 - Recently closed Change Requests
- SLA compliance summary
- Escalation Matrix
 - This lists the people and teams within Cloudreach and the customer organisation to contact and escalate an incident or an issue for example that remains unresolved at a support level

11.1.1.3 Performance Management

- Description of notable performance and/or capacity issues
- Performance charts from Cloudreach, AWS and/or Azure monitoring tools to

support issues

- Information on cause of issue, if known
- Recommendations to remove or prevent future issues, if known

11.1.1.4 Cloud Environment Management

- Cloudreach will capture a view of customer cloud environment and provide the snapshot of it to customer via monthly service reviews;
- Cloudreach will provide a monthly report of the cloud environment compliance based on specified policies and criteria, for example:
 - Configuration management compliance (backups)