

1 Complementary Services for AWS - PaaS & Serverless

1.1 Overview

This service description must be read in conjunction with *Managed AWS - Core Services*.

Complementary Managed Services for AWS - PaaS & Serverless may include the following options which must be selected as In Scope in the SOW:

- (a) Cloud PaaS App
- (b) Cloud Serverless Function
- (c) Cloud Data - Connection
- (d) Cloud Data - Processing
- (e) Cloud Data - Registry
- (f) Cloud Data - Analytics
- (g) Cloud Database

The services listed below are fully supported as an option as part of this Service Description. As Public Cloud technology evolves at such a rapid pace, it is not possible to maintain a fully up-to-date list of supported features and services. This description, therefore, serves as a baseline across common categories and may be updated by NTT in NTT's sole and absolute discretion.

The exact scope of the solution being delivered to the Client and related charges are clearly stated in the Statement of Work (SOW) and any not in Scope shall be explicitly out of scope. Client must provide a valid public cloud subscription for all services herein.

Category	Managed Element	Supported Services
Compute	Cloud PaaS App	. AWS Elastic Beanstalk
	Cloud Serverless Function	. AWS Lambda
Cloud Integration, Data & Analytics	Cloud Data - Connection	. Amazon SQS . Amazon SNS . Amazon SES . Amazon Kinesis . Amazon MSK . AWS Transfer Family (SFTP)
	Cloud Data - Processing	. AWS Glue
	Cloud Data - Registry	. AWS API Gateway
	Cloud Data - Analytics	. AWS Opensearch (formerly Elasticsearch) . AWS Cloudwatch Logs
Database Services	Cloud Database	. Amazon Aurora . Amazon DynamoDB . Amazon RDS (all engines) . Amazon ElastiCache

Table 1 Data & Analytics on Cloud Service Summary

1.2 Compute

- (a) Cloud PaaS App
  - (i) Overview

This element of the service covers the configuration, monitoring and management of Cloud PaaS Applications. Charges are based on the number of instances present in the environment as specified in the SOW only the specified number in the SOW are supported.
  - (ii) Supported Technologies
    - AWS Elastic Beanstalk

AWS Elastic Beanstalk	
Overview	With AWS Elastic Beanstalk, you can quickly deploy and manage applications in the AWS Cloud within AWS Cloud capabilities.

Setup Activities	<ul style="list-style-type: none"><li>. Create a new application</li><li>. Create a new Beanstalk environment</li></ul>
Service Request	<ul style="list-style-type: none"><li>. Modify and existing environment</li></ul>
Service Limitation	<ul style="list-style-type: none"><li>. Lifecycle management of application (application deployments) is Out of Scope. If required, additional CICD pipelines management should be quoted.</li><li>. Client will receive permissions to deploy their application into Elastic Beanstalk.</li><li>. No OS management service is supported on Elastic Beanstalk and is Out of Scope.</li><li>. No Middleware management service is supported on Elastic Beanstalk and is Out of Scope.</li></ul>

Table 2 AWS Elastic Beanstalk

(b) Cloud Serverless Function

(i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Serverless Function. Charges are based on the number of functions present in the environment as specified in the SOW and only those functions are supported.

(ii) Supported Technologies

- AWS Lambda

AWS Lambda	
Overview	With AWS Lambda, you can run code without provisioning or managing servers.
Setup Activities	<ul style="list-style-type: none"><li>. Setup application permissions</li><li>. Create new functions</li></ul>
Service Request	<ul style="list-style-type: none"><li>. Modify Lambda functions environment</li><li>. Manual eventual deployment of new provided code</li></ul>
Service Limitation	<ul style="list-style-type: none"><li>. The provided SOW will define the limits of the Lambda management.</li><li>. Code development is Out of Scope of the service.</li><li>. Management of CI/CD pipelines is Out of Scope, but which can be contracted separately for additional charges.</li></ul>

Table 3 AWS Lambda

1.3 Managed Integration, Data & Analytics

(a) Cloud Data - Connection

(i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Data - Connection services. Charges are based on the number of accounts where resources are in use and the specific limit is specified in the SOW. One line of charge for each service supported as specified in the SOW.

(ii) Technology Supported

- Amazon SQS
- Amazon SNS
- Amazon SES
- Amazon Kinesis
- Amazon MSK
- AWS Transfer Family (SFTP)

Amazon Simple Queue Service (Amazon SQS)	
Overview	Amazon Simple Queue Service (Amazon SQS) is a fully managed by AWS message queuing service that makes it easy to decouple and scale microservices, distributed systems, and serverless applications.
Setup Activities	<ul style="list-style-type: none"><li>. Create queue</li><li>. Setup a dead-letter queue</li><li>. Setup queue trigger to AWS Lambda</li></ul>

<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Create, modify and delete queues</li> <li>. Update queue access policy</li> <li>. Update dead-letter queue</li> <li>. Queue purging</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Queue architecture design is not included as part of this service and is Out of Scope. This effort must be quoted separately as a Professional Services engagement.</li> <li>. Client application integration to use Amazon SQS is not included and is Out of Scope.</li> </ul>

Table 4 Amazon SQS

Amazon Simple Notification Service (Amazon SNS)	
<b>Overview</b>	Amazon Simple Notification Service (Amazon SNS) is a web service that enables applications, end-users, and devices to send and receive notifications from the cloud.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create topics</li> <li>. Endpoint subscription</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Create, modify, delete topics</li> <li>. Create, modify, delete endpoint subscriptions</li> <li>. Apply subscription filter policies (Policy document must be provided by the Client)</li> </ul>
<b>Service Limitation</b>	<p>The following are Out of Scope:</p> <ul style="list-style-type: none"> <li>. Notification architecture design is not included as part of this service. This effort must be quoted separately as a Professional Services engagement.</li> <li>. Client application integration to use Amazon SNS is not included as part of this service.</li> </ul>

Table 5 Amazon SNS

Amazon Simple Email Service (Amazon SES)	
<b>Overview</b>	Amazon Simple Email Service (Amazon SES) is a reliable, scalable, and cost-effective email service designed to help digital marketers and application developers send marketing, notification, and transactional emails.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Setup sending identities</li> <li>. Move identities out of sandbox</li> <li>. Setup SMTP credentials</li> <li>. Setup configuration sets</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Setup sending identities</li> <li>. Create new or update SMTP credentials</li> <li>. Modify configuration sets</li> </ul>
<b>Service Limitation</b>	<p>The following are Out of Scope:</p> <ul style="list-style-type: none"> <li>. Sender reputation is not monitored, neither reviewed.</li> <li>. Reputation management is not included in the service. Client must manage their own reputation.</li> </ul>

Table 6 Amazon SES

Amazon Kinesis Data Streams	
<b>Overview</b>	Client can build custom applications that analyse data streams using popular stream-processing frameworks.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create Data Streams</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Create, modify, delete Data streams</li> <li>. Stream resharding</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Client must provide sharding size.</li> <li>. Client application integration to use Amazon Kinesis is not included and is Out of Scope.</li> </ul>

Table 7 Amazon Kinesis

Amazon Managed Streaming for Apache Kafka (Amazon MSK)	
<b>Overview</b>	Amazon Managed Streaming for Apache Kafka (Amazon MSK) is a fully managed service by Amazon that makes it easy for you to build and run applications that use Apache Kafka to process streaming data.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create clusters</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Create, manage and delete clusters</li> <li>. Scale up broker storage</li> <li>. Update broker types</li> <li>. Broker reboot</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Connection of client applications or configuration of applications to access the Kafka clusters are Out of Scope.</li> <li>. Creation and management of Connectors and Plugins is out of scope.</li> <li>. Creation and management of topics is Outside of Scope.</li> <li>. Additional custom configuration for Apache Kafka must be provided by the Client.</li> </ul>

Table 8 Amazon MSK

AWS Transfer Family (SFTP)	
<b>Overview</b>	AWS Transfer Family is a secure transfer service that stores your data in Amazon S3 and simplifies the migration of Secure File Transfer Protocol (SFTP), File Transfer Protocol Secure (FTPS), and File Transfer Protocol (FTP) workflows to AWS.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create servers</li> <li>. Manage service-managed users</li> <li>. Setup workflows</li> <li>. Manage access control</li> <li>. Setup VPC endpoints</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Create and manage servers</li> <li>. Manage service-managed users</li> <li>. Create and manage workflows</li> <li>. Manage access control</li> <li>. Setup VPC endpoints</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Management of users using AD services or custom identity providers is out of scope of this service. Additional management should be quoted for the additional service</li> <li>. Workflow design is out of scope for the service</li> </ul>

Table 9 AWS Transfer Family (SFTP)

## (b) Cloud Data - Processing

## (i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Data - Processing services. Charges are based on the number of accounts where resources are in use and only the number of accounts specified in the SOW are In Scope in the SOW. One line of charge for each service supported as specified in the SOW.

## (ii) Technology Supported

- AWS Glue

AWS Glue	
<b>Overview</b>	AWS Glue is a serverless data-preparation service for extract, transform, and load (ETL) operations.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Access management (IAM) to AWS Glue Data Catalog.</li> <li>. VPC environment setup</li> <li>. Job creation and scheduling</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Job and crawler creation, modification and deletion</li> <li>. Workflow and blueprint creation, modification and deletion</li> </ul>

<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. ETL script development, classifier definition, crawler definition, workflow definition, blueprint definition are not included as part of this service and are out of scope. Client is responsible for any data manipulation.</li> <li>. Client is responsible to provide data sources metadata into AWS Glue Data Catalog.</li> </ul>
---------------------------	--

Table 10 AWS Glue

## (c) Cloud Data - Registry

## (i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Data - Registry services. Charges are based on the number of resources deployed and only the resource count in the SOW is In Scope. One line of charge for each resource managed.

## (ii) Technology Supported

- AWS API Gateway

Amazon API Gateway	
<b>Overview</b>	Amazon API Gateway is a fully managed service by Amazon that makes it easy for developers to create, publish, maintain, monitor, and secure APIs at any scale.
<b>Setup Activities</b>	. Setup required API Gateway. Any gateway type can be created when client provides all the necessary configurations for it.
<b>Client Request</b>	. Changes on API configuration
<b>Service Limitation</b>	. Client must provide all the information required to create the requested API gateway

Table 11 Amazon API Gateway

## (d) Cloud Data - Analytics

## (i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Data - Analytics services. Charges are based on the number of accounts where resources are in use and only the supported accounts are In Scope in the SOW. One line of charge for each service supported.

## (ii) Technology Supported

- Amazon OpenSearch (formerly Elasticsearch)
- Amazon Cloudwatch Logs

Amazon OpenSearch (formerly ElasticSearch)	
<b>Overview</b>	Amazon OpenSearch Service is a managed service by Amazon that makes it easy to deploy, operate, and scale OpenSearch, a popular open-source search and analytics engine.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Domain creation and configuration</li> <li>. Setup cross-cluster replication</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Apply service software updates on a controlled manner</li> <li>. Upgrade OpenSearch (once a year)</li> <li>. Index storage management</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Applying updates out of business hours may incur in additional costs.</li> <li>. Service includes once a year upgrade for OpenSearch. Client must validate any client not managed by NTT using OpenSearch service is compatible with target version.</li> <li>. Index definition is Out of Scope</li> <li>. Data upload is Out of Scope</li> <li>. Creation of dashboards is not included and is Out of Scope.</li> </ul>

Table 12 Amazon OpenSearch (formerly ElasticSearch)

Amazon CloudWatch Logs	
<b>Overview</b>	Use CloudWatch Logs to monitor, store, and access your log files from Amazon Elastic Compute Cloud instances, AWS CloudTrail, or other sources.

<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Setup log groups and logs streams</li> <li>. Creating metrics from logs for client usage</li> <li>. Configure delivery of logs to Kinesis or Lambda</li> <li>. Export data to S3</li> <li>. Configure stream data to OpenSearch</li> </ul>
<b>Client Request</b>	<ul style="list-style-type: none"> <li>. Setup log groups and logs streams</li> <li>. Creating metrics from logs for client usage</li> <li>. Configure delivery of logs to Kinesis or Lambda</li> <li>. Export data to S3</li> <li>. Configure stream data to OpenSearch</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. NTT only performs ad-hoc log analysis on those logs that come from any other service or non NTT services.</li> <li>. Creation of client specific queries for application logs is Out of Scope.</li> <li>. Creation of visualizations and or dashboards is Out of Scope.</li> <li>. Client must provide any metric definition required.</li> <li>. Development of Lambda scripts for event processing is Out of Scope.</li> </ul>

Table 13 Amazon CloudWatch Logs

## 1.4 Database Services

## (a) Cloud Database

## (i) Overview

This element of the service covers the configuration, monitoring and management of Cloud Databases. Charges are based on the number of instances present in the environment as specified in the SOW and only the number of instances are supported In Scope.

## (ii) Supported Technologies

- Amazon Aurora
- Amazon DynamoDB
- Amazon RDS (all engines)
- Amazon ElastiCache

Amazon Aurora	
<b>Overview</b>	High Performance Managed Relational Database
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create Aurora DB cluster</li> <li>. Configuration of parameter groups</li> <li>. Configuration of the users / databases / permissions</li> </ul>
<b>Service Request</b>	<ul style="list-style-type: none"> <li>. Update parameter groups</li> <li>. Restore an Aurora DB cluster</li> <li>. Start, stop or rebooting DB Instances</li> <li>. Add / remove DB replicas</li> <li>. Management of performance parameters</li> <li>. Execution of Client provided scripts</li> <li>. Management of user access</li> <li>. Database creation and deletion</li> </ul>
<b>Service Limitation</b>	. Client is responsible for data management.

Table 14 Amazon Aurora

Amazon DynamoDB	
<b>Overview</b>	Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with scalability.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create tables as per Client definition</li> <li>. Setup scheduled backups and point-in-time recovery</li> <li>. Configure IAM permissions and access</li> <li>. Setup throughput capacity auto scaling policies</li> </ul>

<b>Service Request</b>	<ul style="list-style-type: none"> <li>. Modify tables</li> <li>. Modify permissions and access</li> <li>. Restore backup</li> <li>. Modify auto scaling policy</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Client is responsible for data management</li> </ul>

Table 15 Amazon DynamoDB

Amazon Relational Database Service (Amazon RDS)	
<b>Overview</b>	Managed Relational Database Service for MySQL, PostgreSQL, Oracle, SQL Server, and MariaDB
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Create DB instances</li> <li>. Setup read replicas</li> <li>. Configuration of parameter groups</li> <li>. Configuration of option groups</li> <li>. Configuration of the users/databases/permissions</li> <li>. Setup scheduled backup and point-in-time recovery</li> </ul>
<b>Service Request</b>	<ul style="list-style-type: none"> <li>. Update parameter groups</li> <li>. Update option group</li> <li>. Restore a DB Instance from snapshot</li> <li>. Start, stop or rebooting DB Instances</li> <li>. Add/remove read replicas</li> <li>. Management of performance parameters</li> <li>. Execution of Client provided scripts</li> <li>. Management of user access</li> <li>. Database creation and deletion</li> <li>. DB engine minor version upgrades</li> <li>. Troubleshoot problems</li> <li>. Session management</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Administrator access to RDS is limited to NTT. Client will receive specific credentials to access the required database.</li> <li>. Client is responsible of data management.</li> </ul>

Table 16 Amazon RDS

Amazon ElastiCache	
<b>Overview</b>	In-memory caching system using memcached or redis engines.
<b>Setup Activities</b>	<ul style="list-style-type: none"> <li>. Setup new clusters</li> <li>. Setup nodes</li> </ul>
<b>Service Request</b>	<ul style="list-style-type: none"> <li>. Add or remove nodes to a cluster</li> <li>. Replace nodes</li> <li>. Adjust node capacity</li> <li>. Autoscale policies definition and setup</li> <li>. Backup management (redis engine cluster only)</li> </ul>
<b>Service Limitation</b>	<ul style="list-style-type: none"> <li>. Sharding and cache strategy definition is not included and is Out of Scope</li> </ul>

Table 17 Amazon ElastiCache