NTT DATA Service Description

Public Cloud Cost Assessment, Planning, Optimization & Management

Introduction

NTT DATA is pleased to provide Public Cloud Cost Assessment, Planning, Optimization & Management (the "Service(s)") in accordance with this Service Description ("Service Description"). Your quote, order form or other mutually-agreed upon form of invoice or order acknowledgment (as applicable, the "Order Form") will include the name of the service(s) and available service options that you purchased. For additional assistance or to request a copy of your service contract(s), contact NTT DATA Technical Support or your sales representative.

The Scope of This Service

Public Cloud Cost Assessment, Planning, Optimization & Management provides cloud infrastructure analytics to help you maximize the value of your cloud investment. In delivering this Service, we will utilize a Software-as-a-Service ("SaaS") based platform providing deep visibility into your infrastructure and actionable analysis that empowers you to make data-driven decisions with confidence at each stage of your cloud journey – from assessing options and planning migrations to managing and optimizing cloud deployments. The three service options available, Assess, Plan, and Optimize & Management, are described below.

NTT DATA, will, at its sole discretion, determine the number of personnel and the appropriate skill sets necessary to complete the Services. Customer understands that NTT DATA resources may include employees of NTT DATA and/or a service provider or subcontractor to NTT DATA.

Assess

Assess measures your existing physical, virtual environment to understand your current application workloads and their performance profiles. Based on the assessment, NTT DATA will determine your optimal cloud configuration by providing information on the instance sizes, network bandwidth and the different price plans available for Amazon Web Services ("AWS"), Microsoft Azure and Google Cloud Platform.

A detailed description of the Assess option is available in Appendix A.

Plan

Plan provides a complete visual of your entire existing infrastructure. It automates the discovery of applications across physical, virtual, and cloud environments and assesses dependencies and cloud suitability for each, so you can prioritize applications for migration and efficiently build a successful roadmap to the cloud.

A detailed description of the Plan option is available in Appendix B.

Optimize & Management

Optimize & Management enables you to actively oversee and control your cloud deployment. It provides actionable insights on cost and performance for all accounts, along with recommendations to both reduce cost and reach optimal performance. You'll understand when to scale up or down to meet your ongoing performance needs so that your cloud configuration is always right-sized and right-priced for the current situation.

A detailed description of the Manage option is available in Appendix C.

Table of Options

	Assess	Plan	Optimize & Management
System/Workload Discovery	✔	✔	-
Right Sizing	✔	✔	-
Total Cost of Ownership (TCO) Projection	✔	✔	-
Multi-Cloud Cost comparison	✔	✔	-
Pricing Plan Optimization	✔	✔	-
Application Discovery	-	✔	-
Application Dependency Visualization	-	✔	-
Cloud Readiness - Suitability Analysis	-	✔	-
Cloud Infrastructure Designer	-	✔	-
Custom Migration Roadmap Builder	-	✔	-
Cost Management	-	-	✔
Billing Analytics + Chargebacks	-	-	✔
Instance Right-Sizing	-	-	✔
Reserved Instance Planner	-	-	✔
Capacity Planning + Forecasting	-	-	✔

Data Collection Form

A Data Collection Form will be provided to the Customer at the project kick-off. This form will allow the customer to provide the IP address and/or host name of each device that will be covered under this Service.

Data Collection Agent

The following information will be collected via the Data Collection Agent and securely passed to the SaaS analytical engine for analysis and report generation. Services will gather the following data:

System Information
- Processor, e.g., "Intel(R) Xeon(R) CPU X5482 @ 3.20GHz"
- Other details about the processor such as processor clock rate, processor family and processor number of cores, memory
- System board vendor and model, e.g., system vendor="Acer" system model="Aspire S7-392"
- Operating system, e.g., Microsoft Windows [Version 6.2.9200]
- System identification information
  - DNS host name, e.g., WIN-C3N2VD185F8
  - System domain, e.g., WORKGROUP
  - System name, e.g., WIN-C3N2VD185F8
  - System workgroup, e.g., WORKGROUP
  - System part of domain, e.g., False
  - VM Name
  - MAC address(es)
  - IP address(es)
  - NIC type, e.g., Ethernet, Intel(R) 82574L Gigabit Network Connection
  - System status
    - Last shutdown time
    - Last boot up time
    - Disk drives
    - Interface type
    - Manufacturer
    - Serial number
    - Description
    - Disk name

System Performance Information
- CPU usage
- Memory usage
- Disk operations
- Network usage
- Cache usage

Process Information
- Program information
  - Executable name
  - Vendor
  - Other information such as product name, description, URL
  - Process performance information
    - CPU usage
    - Memory usage
    - Disk usage
    - Network usage
    - Application specific performance counters

Network Bandwidth Information
- Windows/Linux agents are approximately 5KB to 40KB per 10 minutes.

Exclusions

For the avoidance of doubt, the following activities are not included in the scope of this Service Description:

- Any services, tasks or activities other than those specifically noted in this Service Description.
- The development of any intellectual property created solely and specifically for the Customer.
- Exclusions for each service option are included in the Appendices

This Service Description does not confer on Customer any warranties which are in addition to the warranties provided under the terms of your master services agreement or Agreement, as applicable.

Offer Specific Customer Responsibilities

Both Customer and NTT DATA are responsible for collaborating on the execution of the Services. Customer agrees to cooperate with NTT DATA to help ensure that the Services are successfully completed. Customer agrees it is responsible for the following:

1) Prior to the start of the services engagement, Customer will indicate to NTT DATA in writing a person to be the single point of contact, according to project plan, to help ensure that all tasks can be completed within the specified time period. All Services communications will be addressed to such point of contact (the "Customer Contact"). Failure to do so might result in an increase in scope and/or length in schedule.
2) Customer will provide technical points-of-contact, ("Technical Contacts"), who have a working knowledge of the environment in scope for the Services. NTT DATA may request that meetings be scheduled with Technical Contacts.
3) The Customer Contact will have the authority to act for Customer in all aspects of the Service including bringing issues to the attention of the appropriate persons within Customer's organization and resolving conflicting requirements.
4) The Customer Contact will ensure that any communication between Customer and NTT DATA, including any scope-related questions or requests, are made through the appropriate NTT DATA Service Owner.
5) The Customer Contact will provide timely access to technical and business points of contact and required data/information for matters related to the scope of Service.
6) The Customer Contact will ensure attendance by key Customer contacts at Customer meetings and deliverable presentations.
7) The Customer Contact will obtain and provide project requirements, information, data, decisions and approvals within one working day of the request, unless both parties agree to a different response time.
8) Customer may be responsible for developing or providing documentation, materials and assistance to NTT DATA and agrees to do so in a timely manner. NTT DATA shall not be responsible for any delays in completing its assigned tasks to the extent that they result from Customer's failure to provide such timely documentation, materials and assistance.
9) The Customer Contact will ensure the Services personnel have reasonable and safe access to the Project site, a safe working environment, an adequate office space, and parking as required.
10) Customer will inform NTT DATA of all access issues and security measures, and provide access to all necessary hardware and facilities.
11) Customer is responsible for providing all hardware, software, internet access, and facilities for the successful completion of the Services.
12) Customer agrees to complete a customer satisfaction survey.

13) Customer agrees to provide access to the environment to install the Data Collection Agent OR Customer will install the Data Collection Agent themselves under the guidance and support of NTT DATA.
14) Customer is to provide outbound internet over Secure Socket Layer (SSL) 443 and Secure Shell (SSH) to transfer historical data; this can be via a proxy server to reduce outbound access.

General Customer Responsibilities

Authority to Grant Access. Customer represents and warrants that it has obtained permission for both Customer and NTT DATA to access and use, whether remotely or in-person, Customer-owned or licensed software, hardware, systems, the data located thereon and all hardware and software components included therein, for the purpose of providing these Services. If Customer does not already have that permission, it is Customer's responsibility to obtain it, at Customer's expense, before Customer asks NTT DATA to perform these Services.

Customer Cooperation. Customer understands that without prompt and adequate cooperation, NTT DATA will not be able to perform the Service or, if performed, the Service may be materially altered or delayed. Accordingly, Customer will promptly and reasonably provide NTT DATA with all cooperation necessary for NTT DATA to perform the Service. If Customer does not provide reasonably adequate cooperation in accordance with the foregoing, NTT DATA will not be responsible for any failure to perform the Service and Customer will not be entitled to a refund.

Data Backup. Customer will complete a backup of all existing data, software and programs on all affected systems prior to and during the delivery of this Service. Customer should make regular backup copies of the data stored on all affected systems as a precaution against possible failures, alterations, or loss of data. NTT DATA WILL HAVE NO LIABILITY FOR:

- ANY OF YOUR CONFIDENTIAL, PROPRIETARY OR PERSONAL INFORMATION;
- LOST OR CORRUPTED DATA, PROGRAMS OR SOFTWARE;
- DAMAGED OR LOST REMOVABLE MEDIA;
- THE LOSS OF USE OF A SYSTEM OR NETWORK; AND/OR
- FOR ANY ACTS OR OMISSIONS, INCLUDING NEGLIGENCE, BY NTT DATA OR A THIRD-PARTY SERVICE PROVIDER.

NTT DATA will not be responsible for the restoration or reinstallation of any programs or data.

Third Party Warranties. These Services may require NTT DATA to access hardware or software that is not manufactured by NTT DATA. Some manufacturers' warranties may become void if NTT DATA or anyone else other than the manufacturer works on the hardware or software. Customer will ensure that NTT DATA's performance of Services will not affect such warranties or, if it does, that the effect will be acceptable to Customer. NTT DATA does not take responsibility for third party warranties or for any effect that the Services may have on those warranties.

NTT DATA Services Terms & Conditions

This Service Description is entered between you, the customer ("you" or "Customer"), and the NTT DATA entity identified on your invoice for the purchase of this Service. This Service is provided subject to and governed by Customer's separate signed master services agreement with NTT DATA that explicitly authorizes the sale of this Service. In the absence of such agreement, depending on Customer's location, this Service is provided subject to and governed by NTT DATA's Cloud Solutions Agreement (as applicable, the "Agreement").

Please see the table below which lists the URL applicable to your Customer location where your Agreement can be located. The parties acknowledge having read and agree to be bound by such online terms.

Customer Location	Terms & Conditions Applicable to Your Purchase of NTT DATA Services	
	Customers Purchasing NTT DATA Services Directly From NTT DATA	Customers Purchasing NTT DATA Services Through an Authorized NTT DATA Reseller
United States	www.nttdataservices.com/en-us/contracts	www.nttdataservices.com/en-us/contracts
Canada	Available on request	Available on request
Latin America & Caribbean Countries	Mexico: Your terms and conditions of sale will be sent to you along with your quote	Not applicable
Asia-Pacific-Japan	Available on request	Service Descriptions and other NTT DATA service documents which you may receive from your seller shall not constitute an agreement between you and NTT DATA but shall serve only to describe the content of Service you are purchasing from your seller, your obligations as a recipient of the Service and the boundaries and limitations of such Service. As a consequence hereof any reference to "Customer" in this Service Description and in any other NTT DATA service document shall in this context be understood as a reference to you whereas any reference to NTT DATA shall only be understood as a reference to NTT DATA as a service provider providing the Service on behalf of your seller. You will not have a direct contractual relationship with NTT DATA with regards to the Service described herein. For the avoidance of doubt any payment terms or other contractual terms which are by their nature solely relevant between a buyer and a seller directly shall not be applicable to you and will be as agreed between you and your seller.
Europe, Middle East, & Africa	Available on request	Service Descriptions and other NTT DATA service documents which you may receive from your seller shall not constitute an agreement between you and NTT DATA but shall serve only to describe the content of Service you are purchasing from your seller, your obligations as a recipient of the Service and the boundaries and limitations of such Service. As a consequence hereof any reference to "Customer" in this Service Description and in any other NTT DATA service document shall in this context be understood as a reference to you whereas any reference to NTT DATA shall only be understood as a reference to NTT DATA as a service provider providing the Service on behalf of your seller. You will not have a direct contractual relationship with NTT DATA with regards to the Service described herein. For the avoidance of doubt any payment terms or other contractual terms which are by their nature solely relevant between a buyer and a seller directly shall not be applicable to you and will be as agreed between you and your seller.

Customer further agrees that by renewing, modifying, extending or continuing to utilize the Service beyond the initial term, the Service will be subject to the then-current Service Description available for review at www.nttdataservices.com/en-us/contracts.

To the extent that any terms of this Service Description conflict with any terms of the Agreement, the terms of this Service Description will prevail, but only to the extent of the specific conflict, and will not be read or deemed to replace any other terms in the Agreement which are not specifically contradicted by this Service Description.

By placing your order for the Services, receiving delivery of the Services, utilizing the Services or associated software or by clicking/checking the "I Agree" button or box or similar on the nttdataservices.com website in connection with your purchase or within a NTT DATA software or Internet interface, you agree to be bound by this Service Description and the agreements incorporated by reference herein. If you are entering this Service Description on behalf of a company or other legal entity, you represent that you have authority to bind such entity to this Service Description, in which case "you" or "Customer" shall refer to such entity. In addition to receiving this Service Description, Customers in certain countries may also be required to execute a signed Order Form.

Supplemental Terms & Conditions Applicable to Cloud & SaaS Services

1. **Term of Service.** This Service Description commences on the date listed on your Order Form and continues through the term ("**Term**") indicated on the Order Form. As applicable, the number of systems, licenses, installations, deployments, managed end points or end-users for which Customer has purchased any one or more Services, the rate or price, and the applicable Term for each Service is indicated on Customer's Order Form. Unless otherwise agreed in writing between NTT DATA and Customer, purchases of Services under this Service Description must be solely for Customer's own internal use and not for resale or service bureau purposes.

2. **Important Additional Information**

   A. **Payment for Hardware Purchased With Services.** Unless otherwise agreed to in writing, payment for hardware shall in no case be contingent upon performance or delivery of cloud or SaaS services purchased with such hardware.
   B. **Optional Services.** Optional services (including point-of–need support, installation, consulting, managed, professional, support, security or training services) may be available for purchase from NTT DATA and will vary by Customer location. Optional services may require a separate agreement with NTT DATA. In the absence of such agreement, optional services are provided pursuant to this Service Description.
   C. **Assignment.** NTT DATA may assign this Service and/or Service Description to qualified third party service providers.
   D. **Geographic Limitations and Relocation.** This Service is not available at all locations. Service options, including service levels, technical support hours, and on-site response times will vary by geography and certain options may not be available for purchase in Customer's location, so please contact your sales representative for these details.

3. **Cloudamize Terms and Conditions.** By entering this Agreement, you acknowledge that your use of the Cloudamize services is subject to the Cloudamize Terms of Service, a separate agreement between you and Cloudamize, a current version of which is located here www.cloudamize.com/terms-of-service.

Appendix A – Assess Option

The Assess option will enable customers to choose the best (most economically advantageous) public cloud provider for the specific workload / environment being analyzed. The features of this service option are:

- **Cloud Comparison:** Compare TCO across AWS, Microsoft Azure, and Google Cloud Platform to clearly see how much migrating to each will cost and potential savings your organization could make based on your current application workload. Helping customers make an informed decision on which public cloud provider is the best fit and aid them in making the business case for moving to the cloud.
- **Cost Breakdown:** Gain deep visibility into your cloud TCO. Break down projected costs by compute, storage, and network within both your physical and virtual infrastructure, and drill down to individual machines to understand costs at a micro level.
- **Performance Analysis:** Receive a detailed performance analysis on compute, storage, and network resources based on observed peak CPU utilization, allocated and peak RAM usage, storage capacity, occupancy, Input/Output Operations Per Second (IOPS), and more. Drill down to the node level to see granular data displayed graphically.
- **Hardware Mapping:** Based on one-to-one hardware mapping, accurately project the cost of moving your infrastructure to the cloud using a "lift and shift" approach.
- **Workload Mapping:** Right-size instances based on comprehensive system-level data analysis (such as peak CPU, memory, IOPS, and network usage) and quickly and accurately identify the best cloud configuration for optimal performance at the lowest possible cost.
- **Planning and Forecasting:** Run "what if" scenarios by changing regions, pricing plans, discounting levels, instance types, instance families, and performance thresholds so that you can right-size your infrastructure based on your performance target.
- **Pricing Plans:** Find additional cost savings by determining the ideal pricing packages based on your usage profile.
- **Projection Analysis:** Receive a projected performance analysis on compute, storage, and network resources based on your current observed performance. View a graphic, which can be drilled down to the node level that shows your current performance vs. your performance with your recommended cloud configuration.
- **Reports:** Download TCO reports based on various mapping options and export all graphs and charts as images and spreadsheets.

NTT DATA will monitor the Customer's application workload data collection before assisting Customer in determining their optimal cloud strategy, The Service will help build an understanding of current workloads and their performance profiles in the existing physical or virtual infrastructure and will collect historical utilization data for the metrics that are relevant to application migration.

The Service will assist the Customer in understanding the optimal cloud environment. The Service will determine the optimal cloud configuration and show reports to the Customer to help understand the related cost based on the Customer's current application workload profiles. The Service will aim to find additional cost savings by determining the ideal pricing packages based on the Customer's usage patterns and discount agreements such as a Microsoft Enterprise Agreement (EA).

NTT DATA will run analysis to support multiple scenarios, NTT DATA will run interactive what-if scenarios with parameters including pricing plans, availability zones, usage growth, and performance settings such as usage targets, load growth, and instance size to determine the true cost of cloud adoption.

During a 2-week span, NTT DATA will collect over 500,000 data points daily per workload. Allowing NTT DATA to best assess your infrastructure's cloud requirements.

Project Deliverables and Additional information

Service Owner
The Service Owner will serve as the single point of contact for delivering the Service, providing the following support:
- Establish and manage relationship with identified Customer contact
- Proactively work with the operations team to identify opportunities for improving Customer experience with respect to the Services
- Define key performance measures and periodically review them with Customer

Timeline

On receipt of the order, NTT DATA will email the Technical Contact the Data Collection Form.

The assessment will run for 30 days during which NTT DATA will perform the following tasks:

- **Project kick-off**
  A project kick-off call will be scheduled within 14 days of receiving the order.

  The Customer will provide a list of the resources to be assessed on the Data Collection Form at the Project kick-off meeting.

- **Installation of Data Collection Agent**
  - Agent-less Approach
    - VMWare -based environment (via vCenter read-only credentials)
    - Hyper-V environment (via Data Collection Agent install on Hyper-V host box)
  - Agent-based Approach:
    - Physical Windows/Linux machines
    - Virtual machines for detailed analytics Monitoring:

  NTT DATA will monitor the Data Collection Agents to help ensure that we are receiving the data. It is imperative that we do not have a long break in the collection of data. Should a Data Collection Agent stop sending data then NTT DATA will contact the Technical Contact to investigate why the Data Collection Agent is unresponsive. NTT DATA will assist in troubleshooting the Data Collection Agent, if required.

  Monitoring will start once all Data Collection Agents have been installed and NTT DATA has confirmed that the Data Collection Agents are reporting into the SAAS platform. The monitoring will then run for at least two weeks.

- **Report Generation:** The NTT DATA Service Owner will provide reports detailing the cost of running the workloads in AWS, Microsoft Azure or Google Cloud Platform. These reports will show:

1) Hardware mapping
2) Performance analysis
3) Workload mapping
4) Planning and forecasting
5) Projection analysis

The timeline expectations provided below are estimates; individual project times may vary.

Exclusions

For the avoidance of doubt, the following activities are not included in the Assess option:

- Planning of migration to public cloud
- Migration of the actual workload to the public cloud
- Optimization and Management

Appendix B – Plan Option

This option will enable customers to plan the migration of their workloads to public clouds such as AWS, Microsoft Azure and Google Cloud Platform. The features of this service option are:

- **Migration Designer:** Group applications based on their dependencies, business uses, migration phases, and more.
- **Topology Viewer:** Graphically visualize your group applications and their dependencies.
- **Application Inventory:** Automatically inventory all of your applications and choose which applications are to be considered with inventory settings.
- **Infrastructure Inventory and Summary:** View all nodes within the environment based on user-created groups. View application inventory and dependency details, by group or individual machines, which include inbound firewall rules, client app DNS, CPU usage by application and TCO to migrate.
- **Application Grouping:** Group your servers based on business applications and affinity mapping.
- **Application Dependency Mapping:** Map application dependencies and zoom in on individual dependencies to view details on all processes, such as executable names, application names and descriptions, vendor information wikis, and more to help ensure a seamless migration.
- **Shadow IT:** Find potential shadow IT by identifying dependencies going to IP addresses within your environment that are out of project scope.
- **Firewall Rules:** View firewall rules for /8, /16, and /32 IP address ranges based on your application communication and build your security policies in the cloud.
- **Cloud Suitability Analysis:** Capture an application's cloud compatibility and efficiency gain based on workload characteristics and unique options available in the cloud to identify which applications should be moved to the cloud vs. remain on-premises.
- **Cloud Readiness Analysis:** Determine an application's readiness to run in the cloud based on application dependency mapping, platform portability, and application complexity.
- **Export Data:** Download summary reports for all groups/applications, which detail IP addresses, dependencies, DNS, firewall rules, migration costs, and more.
- **Export Architecture Diagram:** Build your architecture diagram and export it into Scaleable Vector Graphics (SVG) format to edit for your final configuration.

NTT DATA will monitor the customer's application workload data collection before assisting a Customer in planning a cloud migration, The Service will build a detailed understanding of current workloads and their performance profiles in the existing physical or virtual infrastructure and will collect historical utilization data for the metrics that are relevant to application migration.

NTT DATA will provide public cloud experts to help work through the data and identify the workloads that are best suited to a public cloud environment. NTT DATA will also identify applications that may require re-architecting before moving them to public cloud.

Project Deliverables and Additional information

Service Owner

The Service Owner will serve as the single point of contact for delivering the Service, providing the following support:

- Establish and manage relationship with identified Customer contact
- Proactively work with the operations team to identify opportunities for improving Customer experience with respect to the Services
- Define key performance measures and periodically review them with Customer
- Work with the customer to provide a migration project plan

Timeline

The duration of this service depends on the number of physical/virtual devices and the complexity of the applications. In an initial 4-week period, NTT DATA will collect over 500,000 data points daily per workload. Allowing NTT DATA to best assess your infrastructure's migration needs.

The timeline expectations provided below are estimates; individual project times may vary.

- **Project kick-off:**
  A project kick-off call will be scheduled within 14 days of receipt of the order.

  The Customer will provide, on the Data Collection Form, a list of the resources to be monitored during the Plan option.

- **Installation of Data Collection Agent:**
  A Data Collection Agent is installed on all devices, regardless of physical or virtual. This Data Collection Agent will collect detailed performance metrics and will pass the historical data to a SaaS platform. All data is passed over SSL port 443. For information on the data collected please refer to Scope of Service Data Collection.

- **Monitoring:**
  NTT DATA will monitor the Data Collection Agents to help ensure that we are receiving the data, it is imperative that we do not have a long break in the collection of data. Should a Data Collection Agent stop sending data then NTT DATA will contact the Technical Contact to investigate why the Data Collection Agent is unresponsive. NTT DATA will assist in troubleshooting the Data Collection Agent if required.

  Once all the Data Collection Agents have been installed and have registered in the SaaS portal, we will then monitor the environment. We will monitor the environment for at least four weeks.

- **Migration planning:**
  NTT DATA will provide public cloud experts to assist in the migration planning stage, during this period they will:

1) Identify security and firewall requirements
2) Identify shadow IT
3) Provide an application inventory
4) Provide application dependency mapping
5) Provide a cloud suitability analysis
6) Provide a cloud readiness analysis
7) Build an architecture diagram
8) Provide an export of the data for future analysis

Exclusions

For the avoidance of doubt, the following activities are not included in the Plan option:

- Migration of the actual workload to the public cloud.
- Optimization and Management

Appendix C – Optimize & Management Option

The Optimize & Management option will enable customers to identify potential cost savings when running in a public cloud provider such as AWS. The services available are listed below.

- **High-Level Cost Visibility:** Analyze costs at the infrastructure level by viewing data across different accounts, groups, and business units.
- **Account Management:** Manage multiple accounts under a master account. Understand cost, performance data, and recommendations at the master account level down through to individual instances, so you can easily diagnose where there are issues and opportunities for improvement.
- **Reserved Instances (RI) Planner:** Easily and accurately plan RI purchases based on your current and forecasted usage level and understand the Return on Investment (ROI) on up-front commitment versus pay-as-you-go pricing models.
- **Right-Sizing Advisor:** Determine which nodes are over-provisioned, under-provisioned, or optimally provisioned based on Service Level Target (SLT's) and performance thresholds.
- **Instance Right-Sizing Planner:** Right-size instances based on comprehensive system-level data analysis (such as peak CPU, memory, IOPS, and network usage) and quickly and accurately identify the best cloud configuration for optimal performance at the lowest possible cost.
- **Performance Analysis:** Receive a detailed performance analysis on compute, storage, and network resources based on observed peak CPU utilization, allocated and peak RAM usage, storage capacity, occupancy, IOPS, and more. Drill down to the node level to see granular data displayed graphically.
- **Resource Waste and Cost Savings:** Identify idle compute resources and unused storage volumes at the node level and receive recommended actions for optimizations along with their projected cost savings.
- **Billing Analysis and Reports:** Filter billing data by business unit, group, geography, compute, storage, and more to quickly analyze how and where you are spending the most and to simplify bill payments. Download billing reports and email to appropriate owners.
- **Chargeback and Cost Allocation:** Build chargeback reports by business unit, cost tags, or application groups, and generate an invoice for the appropriate stakeholder.
- **Report Builder:** Configure custom reports and schedule automated delivery.

NTT DATA will monitor the customer's application workloads using a Data Collection Agent and will be able to provide recommendations to help reduce the monthly spend within public cloud, the collection of the data will enable NTT DATA to observe workloads over a period of time to identify peaks in workload and help ensure that the capacity is right-sized for the workload.

NTT DATA will provide customers with optimization recommendations on a monthly basis, these reports will identify reconfigurations within the environment that would help ensure that a workload will run at its optimum configuration, in many cases instances are not used or oversized causing expenditure wastage, storage may become orphaned and unused, these reports will help identify this and will recommend the action that the customer must take to drive down the cost. When a system is correctly configured and managed the reports may recommend the increase of an instance based on workload performance.

NTT DATA can assist with consolidating multiple cloud billing accounts into one dashboard. Build departmental chargeback reports using detailed cost and usage data. Utilize extensive reporting using pre-defined filters based on tags, services, availability zones, and more.

NTT DATA will also provide reports to help assist with the forecasting of future load growth based on your usage patterns to predict necessary provisioning and costs.

Project Deliverables and Additional information

Service Owner

The Service Owner will serve as the single point of contact for delivering the Service, providing the following support:

- Establish and manage relationship with identified Customer contact
- Proactively work with the operations team to identify opportunities for improving Customer experience with respect to the Services
- Define key performance measures and periodically review them with Customer
- Obtain all reports and once a month meet with key customer stake holders to advise on actions that need to be carried out.

Timeline

The duration of this service is 12 months.

- **Project kick-off:**
  A project kick-off call will be scheduled within 14 days of receipt of the order.

  The Customer will provide, on the Data Collection Form, a list of the resources to be monitored as part of the Optimize & Management option.

- **Installation of Data Collection Agent:**
  A Data Collection Agent is installed on all devices. This Data Collection Agent will collect performance metrics and will pass the historical data (approx. 5kb to 40kb every 10 minutes) to a SaaS platform. All data is passed over SSL port 443. A proxy can be used to limit the number of devices with outbound internet access, if required. For information on the data collected please refer to Scope of Service and Data Collection section.

- **Monitoring:**
  NTT DATA will monitor the Data Collection Agents to help ensure that we are receiving the data, it is imperative that we do not have a long break in the collection of data, should a Data Collection Agent stop sending then NTT DATA will contact the Customer to investigate why the Data Collection Agent is unresponsive, NTT DATA will assist in troubleshooting the agent if required. Monitoring will run for the 12 month period.

- **Report Generation:**
  The NTT DATA Service Owner will provide monthly reports and recommendations for optimization and configuration changes. Example reports delivered may be as shown below:
  - **Reserved Instances (RI) Planner:** Easily and accurately plan RI purchases based on your current and forecasted usage level, and understand the ROI on up-front commitment versus pay-as-you-go pricing models.
  - **Right-Sizing Advisor:** Determine which nodes are over-provisioned, under-provisioned, or optimally provisioned based on SLTs and performance thresholds.
  - **Instance Right-Sizing Planner:** Right-size instances based on comprehensive system-level data analysis (such as peak CPU, memory, IOPS, and network usage) and quickly and accurately identify the best cloud configuration for optimal performance at the lowest possible cost.
  - **Performance Analysis:** Receive a detailed performance analysis on compute, storage, and network resources based on observed peak CPU utilization, allocated and peak RAM usage, storage capacity, occupancy, IOPS, and more. Drill down to the node level to see granular data displayed graphically.
  - **Resource Waste:** Identifies idles compute resources and unused storage that can be turned off and gives cost impact. For AWS, unused storage is defined as unattached storage.
  - **Billing Analysis and Reports:** Filter billing data by business unit, group, geography, compute, storage, and more to quickly analyze how and where you are spending the most and to simplify bill payments. Download billing reports and email to appropriate owners.
  - **Chargeback and Cost Allocation:** Build chargeback reports by business unit, cost tags, or application groups, and generate an invoice for the appropriate stakeholder.

The timeline expectations provided below are estimates; individual project times may vary.

Exclusions

For the avoidance of doubt, the following activities are not included in the Optimize & Management option:

- Planning of migration to public cloud
- Cloud assessment