

IBM Customer ***IBM Data Warehouse
Performance Optimization for
Data Retrieval
Service Description***

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1. Description of Services

Information Management (IM) Software Services is pleased to submit this Service Description to IBM Customer (“<IBM Cust>”). <IBM Cust> has requested the following services from IBM:

- IBM Data Warehouse Performance Optimization for Data Retrieval (DW Performance Optimization for Data Retrieval) Package.

This DW Performance Optimization for Data Retrieval Package is in response to a specific performance problem by providing systematic data gathering, in-depth analysis, and recommendations for system performance optimization. IBM recommends follow-on HealthCheck services for regular tune-ups and optimization of your Data Warehouse system(s) as you modify your environment profile (e.g. adding users, increasing volumes, changing storage architectures).

This package is specifically designed to allow a customer to have a sample of their existing query environment analyzed. The amount of effort is time-boxed, and is not to exceed the analysis of 5 queries, so that both the <IBM Cust> and IBM can focus on that selection of queries currently presenting the most substantial performance challenges.

The DW Performance Optimization for Data Retrieval Package will undertake the following activities as appropriate, in relation to the queries identified by both the <IBM Cust> and IBM as being achievable in the available time window:

- Review the existing data model
- Review the query objectives of maximum five key queries
- Review the physical database environment of the target database, in particular:
 - Database Partitioning
 - Use of Indexing
 - Use of Materialized Query Tables
 - Use of Multidimensional Clustering
- Review operating system logs, database logs, database and performance statistics
- Review the source of SQL generation to identify if any tooling used sub-optimize SQL generation
- Review Workload Manager Configuration when applicable to identify how the database is managed for dynamic workloads
- Deliver & Review a Recommendations & Findings Report

While the DW Performance Optimization for Data Retrieval Package provides recommendations and findings, it is <IBM Cust>'s responsibility to determine the feasibility of implementing and to implement IBM's recommendations. Contact your IBM Service Sales representative for additional assistance to implement Recommendations and Findings as needed.

This package includes a set of tasks that <IBM Cust> must complete to facilitate a successful DW Performance Optimization for Data Retrieval Recommendation. The actual duration of each task may vary from customer to customer, based upon their knowledge of the products and the complexity of the production environment.

The resources required for this project will include both the IBM and <IBM Cust> personnel.

Any change in the scope of work defined in this Service Description requested by <IBM Cust> may result in additional costs and must be documented in a Project Change Request (PCR).

2. Product Training

The cost for training is not included in this Package. Please visit <http://www.ibm.com/training> for detailed information regarding course descriptions, class schedules, cost, ordering options, and registration instructions.

An IBM Education expert will contact you to discuss your interest in developing a custom training plan for your organization. This no fee assessment provides you with training recommendations that encompasses your entire team and includes cost saving strategies to help you get the most out of your training budget. Training recommendations are based on your team's roles and experience as well as your software products, training preferences and implementation schedule.

In the interests of quality education, IBM reserves the right to update training courses at any time.

3. Resources

The <IBM Cust> Project Team will consist of the resources from the <IBM Cust> technical staff and applications experts. Examples of Project Team members are listed below.

3.1 IBM Team Resources

The IBM Project Lead coordinates the appropriate IM Software Services resources as required. The IBM Team typically includes the following members:

- Solution Implementation Manager (SIM) – Project Lead
- Senior Data Warehouse Specialist (DW Specialist)
- Software Sales Representative (SSR)
- Sales IT Specialist (ITS)

3.2 <IBM Cust> Team Resources

<IBM Cust> will need to identify internal personnel to fill the roles of the <IBM Cust> Project Team. <IBM Cust> is responsible for selecting a Project Lead to share lead responsibilities with the IBM Project Lead.

Depending upon the project, the <IBM Cust> Project Team may include any of the following roles:

- Project Lead
- Database & System Administrator
- Subject Matter Experts as needed

4. Role Definitions

<IBM Cust> will need to identify internal personnel to fill the roles as listed in Section 3, Resources. The following outlines the general roles for each of these individuals. Please note that additional resources may be required at various phases of the Performance Optimization Project. Likewise, not all of the individuals may necessarily be involved in this Performance Optimization service.

Project Lead - This individual will represent <IBM Cust> resources and provide project coordination in conjunction with the IBM Project Lead.

Database & System Administrator - This individual(s) provide on-going DB2 administration assistance and will provide proper access to the Data Warehouse System as necessary for the delivery of this package.

Applications Subject Matter Experts – These individuals will participate in the interview process providing insight into the selected functions as part of the analysis of this Package.

5. Responsibilities

5.1 <IBM Cust> Responsibilities

In order to facilitate a successful delivery, <IBM Cust> has the responsibility to provide the following:

- a.) <IBM Cust> will meet the following requirements prior to initiation of this Performance Optimization Project:
 - Access to a current, supported version of the Data Warehouse Software Stack including DB2 installed and operational.
 - Provide a stable system environment during the service-monitoring period.
 - Access and availability of resources in Section 3.2.
 - Acquire Operating System and Database performance statistics during peak and off-peaks prior the start of this engagement.
 - Hardware and/or software additions or modifications to <IBM Cust>'s IBM DB2 LUW must be completed prior to (preferably) or after delivery of this engagement.
 - Subscription and Support Agreement in place through IBM.
- b.) <IBM Cust> acknowledges that:
 - The results of this engagement may indicate that an application code review may be needed. However, no application code or ETL program review is included in this engagement.
 - The result of this engagement may indicate that a Work Load Management configuration review may be needed.
 - The cost to implement any recommendations made as a result of this Performance Optimization Package described herein is not included in the package. Any implementation of recommendations made herein should be completed by <IBM Cust> themselves or by engaging an IBM Consultant as applicable.¹
 - Work under this package will be performed at your facility in <IBM Cust Location>, except for any project-related activity which IBM determines would be best performed on IBM premises in order to complete its obligations and responsibilities under this package.
- c.) Provide a completed *Performance Optimization Requirements Checklist* before the start of the on-site engagement. This standard checklist allows IBM to make early assessments before arriving on site.
- d.) A Project Lead with sufficient authority to:
 - Represent <IBM Cust>'s interests
 - Serve as the focal point for all decisions and communications between both parties
 - Coordinate activities assigned to <IBM Cust> resources
 - Sign project-related documents

¹ IBM recommends that <IBM Cust> have a local IBM Consultant assist in implementing any recommendations. Should <IBM Cust> elect to have a Consultant implement the recommendations, these services will be delivered separately on a Time-and-Materials (T&M) basis plus expenses. IBM will work with <IBM Cust> customer team to contact and engage the local IBM Client Manager to arrange for delivery of these services.

- e.) Adequate facilities for the DW Specialist including:
 - cubicle, desk, telephone, and Internet access,
 - remote access (e.g., VPN access), as appropriate,
 - direct access to the system under review.
- f.) When performing remote work, <IBM Cust> will provide VPN access, as appropriate, into <IBM Cust>'s network and remote access to a workstation in the network that:
 - can connect to all required servers and
 - is preloaded with all required connectivity tools appropriate to <IBM Cust>'s environment.
- g.) Implementation of any or all IBM's recommendations outlined in the Recommendations & Findings Report once discussed.
- h.) <IBM Cust> will make available all <IBM Cust> personnel required for this project based on the agreed-upon project schedule. Any significant delays caused by <IBM Cust> personnel not being available or project prerequisites not being met may result in schedule delays, which can impact the project sufficiently to require a chargeable PCR addressing additional or extended IBM personnel requirements and additional costs.

5.2 IBM Responsibilities

The IBM responsibilities for the package are:

- a.) Review *Performance Optimization Requirements Checklist* and agree specific list for <IBM Cust>
- b.) Review existing Data Model
- c.) Review the query Objectives
- d.) Review the physical database environment of the target database,
- e.) Review operating system logs, database logs, database and performance statistics
- f.) Review the source of SQL generation to identify if any tooling used sub-optimize SQL generation
- g.) Review Workload Manager Configuration when applicable to identify how the database is managed for dynamic workloads
- h.) Deliver & Review Recommendations & Findings Report
- i.) Deliver completed IBM Data Warehouse Performance Optimization for Data Retrieval Completion Checklist

6. Limitations

6.1 Service Limitations

The DW Performance Optimization for Data Retrieval Package does not include repairs, corrections or troubleshooting of data corruption, errors and faults that are discovered during the process due to hardware failures, or non-qualified hardware or operating systems. Repairs, corrections or troubleshooting of such errors and faults will be <IBM Cust>'s responsibility; any IBM involvement will be charged on a Time-and-Materials (T&M) basis.

IM Software Services resources will be provided Monday through Friday from 8:00 a.m. to 5:00 p.m., excluding holidays and vacation time. Specific details regarding schedules will be mutually agreed-upon prior to the project start date. If necessary, <IBM Cust> will provide after-hours access to your facilities to IBM personnel. Out-of-

town personnel may work hours other than those defined as normal business hours to accommodate their travel schedules.

6.1.1 Travel & Living Expenses

This package does **not** include domestic travel and living expenses incurred by IBM resources traveling to <IBM Cust>'s site in order to fulfill IBM's tasks and responsibilities pertinent to delivering this service.

The DW specialist may travel to <IBM Cust>'s site up to four (4) roundtrip visits for tasks associated with delivering this service. <IBM Cust> will be billed actual travel and living costs.

IBM will invoice <IBM Cust> for travel and living expenses and other reasonable expenses incurred in connection with the package delivery. Amounts are due upon receipt of invoice and payable within 30 days. <IBM Cust> agrees to pay accordingly, including any late payment fee. <IBM Cust> does not have to pay any amount disputed in good faith while it is being investigated, but <IBM Cust> remains obligated to pay any amount not in dispute.

Additional onsite assistance requested by <IBM Cust> beyond the number of visits indicated above will be billable subject to the execution of a PCR. IBM also reserves the right to bill <IBM Cust> for any additional trips that are the direct result of <IBM Cust>'s failure to meet or perform its obligations outlined herein.

7. Project Tasks & Deliverables

IBM will review the information as specified in the Performance Optimization Requirements Checklist. After a detailed in-depth analysis of the information, IBM will review their findings with <IBM Cust>. IBM will use this information alongside the actual review to provide a Recommendations and Findings report of the results of this analysis with a formal executive review with <IBM Cust>.

The Project Team will perform the following tasks. Deliverables for each task are detailed within the task descriptions.

7.1 Task 1: Kickoff Conference Call

The purpose of this conference call is to prepare both the <IBM Cust> project team and the DW Specialist for the DW Performance and Optimization Project. Topics of discussion will include <IBM Cust>'s requirements, expectations, prerequisites, and schedules.

7.1.1 Project Services Description Review

The SIM or DW Specialist will review the Services Description, the deliverables, and the project tasks with <IBM Cust>'s Project Manager.

The starting date to begin the DW Performance Optimization Project for <IBM Cust> will be scheduled and confirmed by IBM and the assigned <IBM Cust> Project Manager.

IBM anticipates scheduling these services within fifteen business days from date of contract signature.

7.1.2 DW Performance Optimization Requirements Checklist Review

During the Kickoff Conference call the DW Specialist will review the *Performance Optimization Requirements Checklist* with <IBM Cust> Project Team.

<IBM Cust> will gather the information requested in the *Performance Optimization Requirements Checklist* before the start of the on-site engagement.

7.1.3 Project Status

The SIM will track all issues and document their resolution in an Issues Log. Any issue whose resolution requires a change will be documented in a PCR.

7.2 Task 2: Gathering of the information & Conducting the interviews

7.2.1 Gathering of the information

The DW Specialist with assistance from the <IBM Cust> DBA where necessary will collect data & monitor <IBM Cust> Data Warehouse environment.

- Data Collected will include:
 - Existing data model
 - Query objectives
 - Physical database environment:
 - Partitioning
 - Indexing
 - Materialized Query Tables
 - Multidimensional Clustering
 - Logs, diagnostics query tables, database statistics
 - Source of SQL generation
 - Workload Manager Configuration

7.2.2 Conducting the interviews

The DW Specialist will interview the subject matter experts to get a better understanding of the applications and validate his initial findings.

7.3 Task 3: Perform Analysis and Identify the Performance Challenge

The IBM DW specialists will review and analyze the collected data. The IBM DW specialist will identify how the five queries can be modified to improve performance. This may be via one of the following or indeed a combination of the following:

- Database Configuration Changes
- Query redesign,
- Additional Indexing, including Multi Dimensional Clustering
- Use of Materialized Query Tables
- Partitioning redesign, e.g. Hash and/or Range
- Operating System and Infrastructure ,
- Application Front End Modifications

Clear advice will be given, regarding the proposed changes and how they should be deployed and monitored.

7.4 Task 4: Presentation to Customer Executive team

IBM will provide a high level overview about their recommendations and findings to the <IBM Cust> executive team and answer any questions or concerns.

7.5 Task 5: Recommendations & Findings Report

The Recommendations and Findings Report will address the following:

- Executive Summary of Recommendations
- Critical System Resource Analysis
- DB2 System Resource Analysis
- Physical Database Changes
- Query Design Changes

7.6 Task 6: Project Completion Checklist

Upon completion of the Recommendations & Findings Report Review, the DW Specialist will deliver to <IBM Cust> a completed DW Performance Optimization Checklist which constitutes completion of this project. Please refer to *IBM Data Warehouse Performance Optimization for Data Retrieval Completion Checklist*.

If issues arise after delivery of the Project Completion Checklist, <IBM Cust> should contact IBM Customer Support.