

GOVERNMENT OF PAKISTAN
REVENUE DIVISION
FEDERAL BOARD OF REVENUE
[CUSTOMS WING]

Project Management Unit - Integrated Transit Trade Management System (ITTMS)
Central Asian Regional Economic Cooperation – Regional Improving Borders Program
1st Floor, Federal Arcade, Kuri Road, Chak Shahzad, Islamabad
Off: (051) 9330377; Fax: (051) 9450006; Email: ali.raza@carec-ribs.gov.pk; azamdkhan88@gmail.com

C.No. 1(81)Cus-Project/ITTMS/PSW/2663

Islamabad, the 19th August, 2024

Subject: Minutes of the Pre-Bid Meeting - Procurement of Oracle Technology Stack or Equivalent for Data Warehouse (DW) and Business Intelligence (BI) Program of Pakistan Single Window (PSW)

A Pre-bid Meeting for subject procurement activity, as was pre-fixed in the Invitation for Bids (IFB) Notice published in leading national dailies, was held on 1st August 2024 at Conference Room of Project Management Unit (PMU), Federal Arcade, 1st Floor, Kurree Road, Jinnah Avenue, Islamabad. The meeting was chaired by the Project Director, Central Asia Regional Economic Cooperation – Regional Improving Borders Services (CAREC-RIBS) Project of Federal Board of Revenue and was attended by the officials of PMU, Pakistan Single Window (PSW) & representatives of the prospective Bidders as per list attached at **Annex – I**. The purpose of the Pre-bid Meeting was to provide clarifications on queries/questions raised by the participating representatives of the prospective bidders on the Bidding Document for subject procurement activity, to facilitate them in preparation of effective technical and financial bids.

2. The proceedings started with welcome remarks, followed by introduction of the participants. At the outset of the proceedings, Chief Strategy and Operations Officer, Pakistan Single Window explained the objective of the PSW and relation of the intended procurement with it. He further elucidated the importance of the procurement activity & delivery timelines, which would contribute in bringing efficiency in the operations & functions of Pakistan Single Window.

3. The prospective bidders were thereafter invited to share their queries for clarification by PMU's & PSW's Technical Teammates. In addition, the representatives were also given three (03) days' time, to share their queries in writing also, enabling avoiding any confusion. In this regard, it was clarified that PMU would reply to all the queries of the prospective bidders in the form of Minutes of Pre-bid Meeting, without disregarding any repetitive query by more than one bidder, however, pursuant to Clause 7 viz. Clarification of Bidding Document of Section 1 viz. Instructions to Bidders at Page 1-11 of the Bidding Document, the identities of the bidders would not be disclosed in the responses. The Minutes of Pre-bid Meeting would be shared with all the prospective bidders who have participated in the Pre-Bid Meeting and/or would have asked for clarifications subsequent to the Meeting. Besides, the Minutes would also be uploaded on the website of the Federal Board of Revenue www.fbr.gov.pk/tenders.

4. Accordingly, the following table provides all queries by the prospective bidders and replies thereof by PMU:

S. #	Nature/ Relation of Quer	Clarification Required	Replies
Prospective Bidder # 1			
1	Technical	The quantity mentioned, 18 for processor license type, means 18 processor cores or 18 processors?	36 cores intel/18 Processors
2	Technical	If 18 processors, then what must be the cores of processors?	36 cores intel/18 Processors
3	Technical	Any year-on-year growth forecast? Or month on month for at least next 15 months?	Projected Growth: 2.5TB for 5 months.
4	Technical	Current data size which needs to be migrated, if there is migration from current system?	Current OLTP source system is on MS SQL with the size of the system is 2.5 TB.
5	Technical	Number of data sources which would be sourced?	8 to 10.
6	Technical	Any existing encryption in place?	No encryption is in place.
7	Technical	Any existing compression in place?	Default compression of MS SQL server is in place.
8	Technical	Current system from which data would be migrated?	Current OLTP source system is on MS SQL with the size of the system is 2.5 TB.
9	Technical	Current systems which would be sourced, apart from Oracle or equivalent?	Microsoft SQL Server
10	Technical	Licensing; would it be required perpetual or subscription?	Perpetual.
11	Technical	Hardware; is it required or only hardware specifications must be shared?	Not required.
Prospective Bidder # 2			
13	Technical: Data Integration & Centralization	Is all the data structured or there's some semi-structured and un-structured data as well.	Structured and Semi-Structured
14	Technical: Data Integration & Centralization	Is existing source environment distributed or centralized?	Centralized.
15	Technical: Data Integration & Centralization	How many Sources will be part of solution? Please mention the Databases Technologies/ platforms & Versions of each source system.	8 – 10 data sources. Microsoft SQL Server 2019 and Microsoft SQL Server 2022.
16	Technical: Data Integration & Centralization	List of source systems along with go live data volume and daily incremental volumes.	Not Applicable
17	Technical: Data Integration & Centralization	Please mention the data consistency & quality percentage across the source system.	± 95%
18	Technical: Data Transformatio ETL	Is there a requirement for real-time or near real-time ETL?	Near real-time.
19	Technical: Data Transformatio ETL	Please mention Approx. the number of Tables with attributes of data being pulled and pushed into Proposed solution.	Approx. 300 tables and approx. 30,000 attributes and 2000 DB procedures

20	Technical: Data Transformation: ETL	To what degree have you defined and documented definitions and business rules for the necessary transformations, key terms and metrics? (i) No business rules defined. (ii) Most of the business rules defined and documented. (iii) Few business rules defined and documented. (iv) All business rules defined and documented. (v) Some business rules defined and documented	Some business rules defined and documented
21	Technical: Data Modeling & Schema Design	Do PSW requires Conceptual, Logical and Physical data models for the centralized data warehouse repository (ER Model)?	Not applicable.
22	Technical: Data Modeling & Schema Design	It is assumed that the reporting and Analytics will be performed against dependent datamarts (Dimensional Models). Please explain	Yes, but datamarts are not the only source for reporting.
23	Technical: Advanced Analytics Data Mining	Please explain the estimated number of Analytics required.	Not applicable.
24	Technical: Self-Service BI & Reporting	What is the existing BI/reporting tool / platform?	Not applicable.
25	Technical: Self-Service BI & Reporting	Are the reporting requirements already documented?	Not applicable.
26	Technical: Self-Service BI & Reporting	If not, number of Business Users that will need to be interviewed.	We have around 200 business users.
27	Technical: Self-Service BI & Reporting	Please share the list of multiple stakeholder locations for requirements gathering.	Dry ports, Sea ports, Airports and other government agencies (70+)
28	Technical: Self-Service BI & Reporting	What are the estimated numbers of standard reports/ Adhoc will need to be developed? (i) Specify the No. of Dashboards? (ii) Specify the No. of Reports? (iii) Total Business KPIs?	Depends on the final scope of the project.
29	Technical: Real-time Data Insights	From how many source systems real-time data will be streamed?	8 to 10
30	Technical: Real-time Data Insights	Are requirements defined for Real-time data insights?	No.
31	Technical: Security & Governance	Are Security and Governance strategies already established?	Yes.

32	Technical: Security & Governance	What are the policies related to data security that need to be followed?	Data in motion and data in rest encryption/decryption policies will be followed.
33	Technical: Security & Governance	Is Data Retention in scope? If yes, what is the Data retention period expected?	Last 10 years.
34	Technical	Are you open for onsite and/or offshore work model?	On-Site
35	Technical	How many environments envisioned for this project: Development, Test, Production, Disaster Recovery, etc.?	Production
36	Technical	Are there any pre-defined backup policies that are to be implemented?	Yes
37	Technical	What are the disaster recovery requirements for this solution? Please explain the Snapshot timeframes and time to recovery targets.	No.
38	Technical	As per the technical requirements, it is concluded that we only need to quote the software part and hardware (as per requirement) will be provided by PSW. Provisioning of Oracle Exadata Database Machine or equivalent, will not be applicable. Please confirm	Yes. As given in RFP.
39	Commercial	As Oracle or equivalent software products comes under non-tangible goods category and licenses/SKUs will be emailed directly to PSW nominated official. So, there will be no physical delivery of goods. So physical inspection mentioned at Page 8-96 would not be applicable. Please clarify	Indeed, physical delivery of goods shall not be happening. However, the term physical inspection, defined at Clause 26.2 at the referred page, should not be confused with physical inspection which is executed in the case of supplies of goods. In this procurement process, physical inspection means the confirmation of Pakistan Single Window that the delivered software through an appropriate mean of delivery, is the one which is fulfilling all the technical requirements & features which have been defined in the Technical Specifications, at installation. The deployment of software within PSW's systems and its integration shall be followed by above referred confirmation.
40	Commercial	As these are software products and Oracle or equivalent licenses will be issued in the name of PSW with 03 years support. So, it is requested to please reduce the Performance BG requirement for 06 months (instead of 03 years)	A reference is made to Special Conditions of Contract at Clause 18.3 & 18.4 (P: 8-197/198) which may be read and understood in correlation with the respective General Conditions of Contract at P: 7-187. The request cannot be acceded to and it is requested to please follow the requirements outlined in the Bidding Document.


			<p>However, it may be a prerogative of the Pakistan Single Window during, being the end-user, to decide in the matter after the completion of contract, appropriately.</p>
41	Commercial	<p>Please refer to page 2-29, can we submit Bid security in the form of Pay Order, CDR or only BG is required. Please clarify.</p>	<p>NO.</p> <p>A Bid Security is required in the form of an unconditional bank guarantee in complete compliance with the format provided, in Section 4 Bidding Forms</p> <p>ITB 21.1 at Section # 2 viz. Bid Data Sheets, page 2-29, is referred which is explicit.</p>
42	Commercial	<p>Please refer to page 4-49 to 4-53, the local vendor registered in Pakistan, will be quoting Oracle or equivalent or equivalent Technology which will be supplied from abroad (via email). So, we need to quote CIP prices and payment will be released through LC, abroad OR we need to quote DDP prices (inclusive of all taxes and GST) and payment will be released to us locally in Pakistan. Please clarify.</p>	<p>The Local/National Bidders, are required to follow the Form titled; Price Schedule for IT Products to Be Offered from Within the Purchaser's Country, provided at page 4-49 wherein costs on account of applicable/payable indirect taxes in Pakistan, have been required. The said Form impliedly constitutes the quoting of final price covering all the technical & functional requirements, based on Delivered Duty Paid (DDP) cost. Accordingly, the final price arrived using this Form, should be reflected in Form given at Page 4-53.</p> <p>The contract shall be agreed on the basis of the price, offered in the Letter of Price Bid based on the Form titled; Grand Summary, provided at Page 4-53 (i.e., inclusive of applicable indirect taxes), as per above explanations and payments shall be made accordingly.</p>
Prospective Bidder # 3			
43	Commercial	<p>Can we propose our own payment terms?</p>	<p>NO.</p> <p>Provisions at Clause 3.1.2 at Section # 3 viz. Evaluation & Qualification Criteria, page 3-39, is referred where it is explicitly provided that Deviations from the Payment Terms as specified in SCC 16.1, is NOT PERMITTED.</p> <p>Please note that according to Instructions to Bidders (ITB) Clause 30 at Page 1-21, "Deviation" is a departure from the requirements specified in the Bidding Document" which makes a bid non-responsive.</p>

44	Commercial	<p>At any point during performance of the Contract, for IT Products and Services still to be delivered, the Bidder will also pass on to the Purchaser any cost reductions and additional and/or improved support and facilities that it offers to other clients of the Supplier in the Purchaser's country, pursuant to GC Clause 11.2. (Ref: section 6, page 77)</p> <p><i>The said clause is limited to the reduction in cost which shall pass on to the purchaser by virtue of this clause. It is therefore, advised that any increase in cost of Product/Services should also pass on to the Purchaser.</i></p>	<p>It is reiterated that the Purchaser has not invited any comments on the bidding document and/or its Clauses.</p> <p>The referred Clause in the bidding document, is explicit and needs no further clarification. It is fixed clause and cannot be changed.</p>
45	Commercial	<p>All OEM's have their own Authorization Format, so we would like to request to please accept accordingly</p>	<p>The bidders must follow and strictly comply with the Authorization Letter's Format, provided in the bidding document at Page 4-56, Section 4 viz. Bidding Forms.</p> <p>Please carefully read Clause 19.2, Documents Establishing the Qualifications of the Bidder at Section 1 viz. Instructions to Bidders, Page 1-15.</p>
46	Commercial	<p>Whether the indirect taxes i.e., GST shall be applicable as per the respective taxation laws of Federal Government i.e., Islamabad Capital Territory (ICT) or Provincial (Sindh Revenue Authority)?</p>	<p>At present, in the bidding document, Data Centre Facility of Pakistan Single Window located at Pakistan Telecommunication Company Ltd. (PTCL), I. I. Chundrigar Road, Karachi, has been reflected at the moment. The bidders are requested to offer their cost mindful of indirect taxation laws of Government of Sindh as if the location remains the same, the said laws shall apply.</p> <p>Nonetheless, acknowledging the fact that the deliveries under contract shall happen through internet medium and the software can be delivered/accessed at anywhere in Pakistan, therefore, the Pakistan Single Window shall determine appropriately at the time of contracting about the delivery location and accordingly decide the impact of indirect taxation cost in the contract as per the prevalent related laws of the region, cautious of the reality that the change of delivery location shall have no cost impact on the supplier's cost as no inland transportation shall be happening.</p>
47	Commercial	<p>For Performance Guarantee, we would like to request, please allow Insurance Guarantee for providing performance Guarantee.</p>	<p>It is unfortunate that the request cannot be acceded to. Please follow the Bidding Document.</p>
48	Commercial	<p>At Page 6-74 of Section 6 viz. Schedule of Requirements, under heading Technical Compliance; Training condition has been defined.</p>	<p>i) 9 participants ii) 8 participants iii) 8 participants</p>

		<p>Moreover, in the payment terms, mentioned at Page 8-95 of Section 8 viz. Special Conditions of Contract, condition of “impart of necessary training” has also been tagged with the release of payment.</p> <p>Kindly explain what kind of training will be required.</p>	
Prospective Bidder # 4			
49.	Technical	<p>Please provide number participants per training for the following:</p> <ul style="list-style-type: none"> (i) Oracle (or equivalent) Database Enterprise Edition (ii) Oracle (or equivalent) Analytical Server (OAS) (iii) Oracle (or equivalent) Data Integrator (ODI) 	<ul style="list-style-type: none"> i) 9 participants ii) 8 participants iii) 8 participants
50.	Technical	<p>Please provide details of existing source</p> <ul style="list-style-type: none"> (i) Database size (ii) Database version (iii) OS version (iv) Compute details 	<p>Database size : 6.5TB Database version : SQL Server 2019 and SQL Server 2022 OS version : Windows server 2019</p>
51.	Commercial	<p>Kindly also advise how can we submit technical and functional compliance against the solution.</p>	<p>The technical and functional requirements have been duly defined in the Section 6 viz. Schedule of Requirements of the bidding document. It is advised to follow the requirements and provide the technical solution giving each and every detail which the bidder considers appropriate to explain the proposed solution.</p> <p>In this regards, attention is also invited to the provisions given in at Clause 11 viz. Documents Comprising the Bid of Section 1: Instructions to Bidders and ITB 11.2 (j) of Section 2 viz. Bid Data Sheet of the Bidding Document.</p> <p>Please follow the above referred requirements and instructions while preparing the bid and offering technical solution with functional details.</p> <p>It is envisaged that all the bidders, being relevant to the field of required software, would be sufficiently aware of the parameters that shall be expected from the bidders, to offer in their technical specifications. However, giving every bidder an equal & fair chance, if they is any confusion, the minimum parameters that shall be considered during the evaluation of offered technical solution, are summarized at Annex – II for ease of reference. It is desired that all the bidders should specifically cover</p>

			and responded to the listed technical parameters, at least.
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5. The meeting ended with a vote of thanks by the Project Director, CAREC-RIBS Project re-assuring the integrity of the bidding process.


(Muhammad Ali Raza)
Project Director

LIST OF PARTICIPANTS

S.#	Names of Representatives	Designation	Officials/ Prospective Bidders
1.	Muhammad Ali Raza	Project Director	CAREC-RIBS Project, FBR
2.	Mr. Athar Fahim	Chief Strategy and Operations Officer	Pakistan Single Window
3.	Mr. Sheeraz Abdul Rasheed	Head of Network & IT Infrastructure	Pakistan Single Window
4.	Mr. Noman Siddiqui	ICT & Security Specialist	PMSC, CAREC-RIBS Project
5.	Mr. Awais Saleem	Procurement Specialist	PMSC, CAREC-RIBS Project
6.	Mr. Azam Dil Khan	Monitoring & Evaluation Officer	CAREC-RIBS Project, FBR
7.	Mr. Abdullah Masood	--	M/s Pronet Pvt. Ltd.
8.	Mr. Sajid Zaidi	--	M/s Techaccess Pakistan
9.	Mr. Faisal Khan	--	M/s Ora-Tech Systems
10.	Mr. Amjad Khan	--	M/s Techaccess Pakistan
11.	Syed Waiz Shah	--	M/s Teradata Pakistan
12.	Muhammad Asif Ali Aslam Khan	Manager Solution Engineering	M/s Teradata Pakistan
13.	Mr. Abdul Nasir Khan	Head of Consulting Sales	M/s Teradata Pakistan
14.	Mr. Irfan Shahzad	--	M/s Oracle Pakistan
15.	Mr. Ahmed Faraz	--	M/s CNS Engineering, Pakistan
16.	Muhammad Ahsan Saleem	--	M/s CNS Engineering, Pakistan
17.	Mr. Wajid Ali	Manager Sales	M/s Premier Systems Pvt. Ltd., Pakistan
18.	Muhammad Tallah	--	M/s Jazz Pakistan

Table 1

No	SOLUTION FEATURES AND FUNCTIONALITY
	Automated Data Warehouse Management:
1	The solution must automate routine database tasks, including tuning, patching, and backups, to minimize administrative overhead.
2	It must integrate built-in machine learning capabilities to optimize performance and provide predictive insights.
	High-Performance Computing:
3	The solution must deliver extreme performance with optimized hardware and software integration, ensuring superior I/O throughput and low-latency data access.
4	It should support a scale-out architecture, allowing seamless scaling of compute and storage resources to accommodate growing data demands.
	Multimodal Database Support:
5	The solution must support multiple data models, including relational, JSON, XML, spatial, and graph, within a single database engine.
6	It should provide advanced analytics capabilities directly within the database to reduce data movement and improve performance.
	High Availability and Scalability:
7	The solution must offer high availability and disaster recovery with active-active clustering, ensuring continuous availability and load balancing.
8	It should enable horizontal scaling by adding more nodes to the cluster, enhancing performance and resilience.
	Advanced Security Features:
9	The solution must provide comprehensive data encryption at rest and in transit to ensure data security and compliance with regulatory standards.
10	It should enforce strong access controls and segregation of duties to protect sensitive data from insider threats.
	Comprehensive Data Integration:
11	The solution must offer powerful data integration capabilities with support for various data sources and complex data transformations, ensuring seamless data flow across the enterprise.
12	It should enable real-time data integration and replication to support time-sensitive analytics and reporting.
	In-Database Machine Learning:
13	The solution must allow data scientists to build, deploy, and manage machine learning models directly within the database, reducing data movement and improving performance.
14	It should automate model selection, feature engineering, and hyperparameter tuning to accelerate the machine learning workflow.
	End-to-End Data Warehousing Solutions:
15	The solution must be END to End owned by single OEM against the Section 6: Schedule of Requirements sub section TECHNICAL COMPLIANCE
16	Bidder should propose Single OEM solution with comprehensive suite of Database with DB security & High Availability (Active-Active Clustering), data warehousing tools, ETL tools, and Data visualization tools.
17	There should not be third party products or tools in the proposed solution.

	Advanced Compression and Storage Optimization:
18	The solution must employ technology that significantly reduces storage requirements while improving query performance through efficient data compression.
19	It should use smart storage techniques to offload intensive data processing tasks to storage servers, freeing up database server resources and enhancing overall performance.
	OEM-Managed Platform with Service Level Objectives (SLOs):
20	The solution must provide an OEM-managed platform that automates maintenance tasks such as patching, updates, and backups, ensuring minimal administrative overhead.
21	It should be backed by robust Service Level Objectives (SLOs) to guarantee high availability, performance, and reliability.
22	The solution must offer built-in monitoring and diagnostic tools managed by the OEM to proactively identify and resolve issues, maintaining optimal operational performance.
	Unified OEM-Owned Platform and Database Engine:
23	The solution must provide a single, unified platform and database engine owned and managed by the OEM, ensuring streamlined operations and support.
24	It should ensure a single point of contact for all operational and support needs, simplifying issue resolution and service management.
25	The unified platform must offer consistent performance and reliability, eliminating potential conflicts or performance issues from multi-vendor environments.
	Vector Search for RAG Use Cases:
26	The solution must support vector data types and vector indexing to facilitate Retrieval-Augmented Generation (RAG) use cases.
27	It should provide efficient vector search capabilities that allow for rapid similarity searches and data retrieval from large datasets, enhancing AI and machine learning applications.
	OEM-Owned Data Visualization Platform:
28	The solution must include an OEM-owned data visualization platform that is recognized as a leader in the industry.
29	The platform should have built-in machine learning models, enabling advanced analytics and data visualization capabilities directly within the solution.
30	It must provide an intuitive interface and robust integration with the data warehouse to simplify data analysis and reporting.
	RAFT Replication for High Availability:
31	The solution must support RAFT replication to enable rapid failover within seconds and ensure zero data loss during node or data center outages.
32	It should facilitate an Active-Active-Active symmetric distributed database architecture to enhance availability, simplify management, and optimize resource utilization globally.
33	The replication mechanism must ensure consistency and reliability across distributed environments, providing a robust foundation for critical applications.
	GenAI Use Cases Enablement:
34	The solution must support GenAI use cases through features that allow querying data using natural language.
35	It should leverage generative AI with Large Language Models (LLMs) to convert user input text into SQL queries.
36	The solution must process natural language prompts, supplement the prompts with metadata, and then generate and execute SQL queries, stream.

Table 2

No	TECHNICAL COMPLIANCE
1	Does the DBMS support referential integrity?
2	Does the DBMS support ACID transactions?
3	Are there integrity constraints over nonrelational data types (JSON, XML, etc.) stored in the schema of the database?
4	Do the DBMS support multiple programming languages such as Node.js, Go, Ruby? Please list all languages supported with specific libraries.
5	Is there a JDBC interface to the DBMS?
6	Is there an OLEDB interface to the DBMS?
7	Does the DBMS support a form of SQL for stored procedures?
8	Does the DBMS support special functionality for testing applications during the upgrade to a new release of the DBMS?
9	Does the DBMS contain tools to analyze and test prebound plans from one release to another?
10	Does the DBMS support data encryption? Use the comments to explain the highest level available. Is this an extra cost?
11	Does the DBMS support a form of user authentication? In comments, describe the security on authentication.
12	Does the DBMS support single-sign-on mechanisms for user authentication? In comments, describe the supported technologies.
13	Does the DBMS offer in-DBMS multitenancy? Is this feature extra cost? Please explain how this is implemented and the implications in the comments.
14	Does the DBMS support native spatial data types?
15	Does the DBMS include optimized support for time series data types?
16	Does the DBMS have support for other types of LOBs for media files?
17	Does the DBMS support multiple data or object models natively within the DBMS file system? Please specify what native models are included and if they are an extra cost.
18	Does the DBMS support XML in native binary storage? (This does not include the storing of XML in a LOB or XML shredding.)
19	Does the DBMS contain backup and recovery tools?
20	These are the tools for creation and control of a database. Comments should explain the level of automation.
21	These include DBA tools for monitoring and managing the DBMS.
22	The utilities built-in to the DBMS to automate the normal day-to-day DBA operations.
23	Are there graphical automation tools for DDL and DCL?
24	Are there tools included for managing an HA/DR environment? Use the comments to describe any third-party tools available to manage this environment.
25	Does the DBMS contain tools to manage the storage devices used by the DBMS? Describe the level of integration with the storage management products certified for use with the DBMS.
26	Does the DBMS support geographically distributed HA? Please note maximum distances allowed.
27	Does the DBMS support a DR environment? Use the comments to specify options such as "hot," "warm" and "cold."
28	Does the DBMS have a cost-based optimizer?
29	Does the optimizer have a plan analyzer to tune the optimization plans and bind them to a specific SQL statement?
30	Does the DBMS support partitioned indexes?
31	Does the DBMS contain automatic tuning functions for contiguous tuning of the DBMS without DBA intervention?
32	Can buffer management be monitored and is the memory buffer management tunable?

33	Does the DBMS support an in-memory column-store for analytic workloads? Please note in comments if this is an extra cost.
34	Does Active Data Guard be enabled for In-Memory column store?
35	Is Recovery catalog support allowed to restore at PDB level?
36	How are indexes managed in DBMS?
37	How are regression testing carried out in DBMS?
38	Does DBMS have any tool that supports taking the backups to Amazon S3 storage cloud?
39	Does DBMS have Built-in Capability to Unwind Specific Transaction?
40	Does DBMS have Built-in Capability to Unwind Specific Table or object to specific point in time?
41	Does DBMS have Built-in Capability to Unwind full database without need to restoration?
42	Does DBMS have Built-in Capability to recover dropped objects?
43	Does DBMS have Online Database Patching?
44	Does DBMS have Rolling Database Patching?
45	Does DBMS have Query parallelism?
46	Does DBMS have Fast Incremental Backups?
47	Does DBMS have Support of OLTP and Analytical Workload on same Database?
48	Does DBMS have Multiversion read consistency to avoid transaction blocking and performance degradation?
49	Does DBMS have Disaster Recovery with Database Partitioning?
50	Does DBMS have Automatic Storage Rebalancing without need to manual Management?
51	Does DBMS have Notification blackouts for managing target downtime windows?
52	Configuration management including Search and Inventory, configuration history, and compliance
53	Does DBMS have User Profiles?
54	Does DBMS have Native discovery of sensitive, high-risk data?
55	Does DBMS have Auditing based on individual actions, such as SQL statement type, or on combinations of data that can include the user name, application, time ?
56	Does DBMS have Auditing Data to be stored in Database?
57	The solution shall identify and prevent misuse of authorized user access.
58	The solution shall have the ability to configure access determined by user, by service, by source IP address.
59	Do Database Vault Privilege Analysis has performance overhead on the database?
60	Do Database Vault Realms and Command Controls has performance overhead on the database?
61	Can we move Database Vault security Policies from a development system to a production system?
62	How does Database Vault help address customer compliance requirements?
63	Does Database Vault provide any security in the Cloud?
64	Database Vault should meet compliance requirements found in Sarbanes-Oxley, PCI, HIPAA, ITAR, and EU privacy laws?
65	DBAs should be prevented from making unauthorized system and session changes in the database?
66	can we apply patches in a Database that is protected by Database Vault?
67	Database security software should work from within the RDBMS to enforce the security rules and access controls regardless of the type of client connections to the RDBMS.
68	Database security software should enforce separation of duties and highly privileged database administrators should be prevented from modifying security policies.
69	Database security software should provide a flexible architecture supporting rule definitions through SQL procedures, reuse of rule definitions and security policies.
70	Database security software should prevent users accessing the database from unauthorized IP addresses and should allow user specific policy definitions.

71	Database security software should provide controls on who, when, where and how the database is accessed.
72	Database security software should provide a web-based interface using the HTTPS protocol to manage security policies and security reports for the database access.
73	Database security software should provide an API to define the security rules through SQL procedures.
74	Database security software should provide reports to detect unauthorized access attempts to the database.
75	Database security software should prevent data access from database triggers, stored procedures and functions.
76	Database security software should still enforce security policies in case of network encryption between clients and database server.
77	Does the DBMS support geographically distributed HA? Please note maximum distances allowed.
78	Can change management be performed to database schema across multiple instances of the same database? Comments should explain the level of automation.
79	Can configuration changes be made to multiple instances of the same database, again without stopping the DBMS?
80	Does the DBMS support clustering of servers to increase the processing power beyond limitations of current symmetric multiprocessing (SMP) servers? Comment on which vendor's clustering is supported.
81	Does the clustered server implementation allow for multiple applications to run across the cluster with appropriate management?
82	Does the DBMS allow for multiple databases to be supported across the cluster? (Specifically, does the vendor support transaction systems and data warehousing on the same cluster?)
83	Does the DBMS support mechanisms to implement zero downtime? Please explain supported mechanisms.
84	Does the DBMS support a scale-out (clustered) architecture? Describe in comments the necessary clustering software supported in each operating environment. Fully detail any known limitations of the clustered architecture, such as hardware requirements, constraints on cloud deployment environments or throughput limitations.
85	The system must be available and 100% functional for users in the event of a hardware failure on one of the cluster servers.
86	The proposed solution should be implemented in each CN active-active database clusters, with at least two distinct computer nodes, for the emergency call reception and dispatching system
87	The proposed solution should support for load balancing between nodes at request and executions level on the cluster database, including the possibility to query the cache memory for the other nodes, offering a even spread of the load
88	The proposed solution should provide their own clustering and disk management software to allow running on different platforms, operating systems, or file systems without additional software acquisition from the operating system manufacturer, while ensuring the horizontal scalability of the database .
89	The proposed solution should provide a workload management tool?
90	Do DBMS have High Availability and scaling out by adding nodes without Need to add specific H/W?
91	Do DBMS have Online addition for Cluster node?
92	Do DBMS have Shared access to same data over multiple servers, Without Need for Partitioning The Data?
93	Do DBMS have Transparent Workload distribution on multiple servers without Data Partitioning?
94	Do all DBMS instances are active and serve the production workload?
95	Ability to connect to most of databases / appliances as target
96	Compatibility with any O/S (e.g., Window, Unix, Linux)
97	Provide robust Authorization & Authentication layers
98	Ability to create modify different security profiles (e.g., group, user, folder, object, etc.) to enable multi-user development environment

99	Ease of use and comprehensiveness of Security Modules
100	Readily available troubleshooting guides and Wizards
101	Suitability for Onsite / Offshore Environment
102	Integrated with Data Quality Tools
103	Nominal Learning Curve
104	Ease of administration and maintenance
105	Ease of installation & Configuration
106	Ease of Upgradation (form lower to higher version)
107	Quantity of available documentation (e.g. manuals - pdfs, docs, ppts, ect.)
108	Quality of On-line help facility (e.g. Help File within the Tool, redirect to Product Supplier Internet Website etc.)
109	Sophisticated GUI Interface for design and development
110	Optimized Code Generation in Support Database Language
111	Speed of Development - Robust Architecture and Integration to increase the productivity
112	No need for knowledge for proprietary Language for development
113	Inbuilt support for handling the slowly changing Dimensions
114	Support Web Services
115	Tool Integration with other Tools (Data cleansing, data transformation, BI, etc.) or preferably built-in tool
116	Supports ELT architecture
117	Allows BULK based loading on to the target database
118	Constraint management features. - Disabling / enabling and can use DB parallelism and features to load the target
119	Support for DB specific procedural language or open language to handle complex ETL logic
120	Supports and utilizes clustering of the source and target database
121	Reusable mappings / ETL processes, should be able to call a ETL mapping from another mapping
122	Able to extract data from flat files as well as load into flat files
123	Be able to use and call DB features / utilities where applicable like SQL Loader etc and the mappings should be able to generate the code for the loaders where applicable (flat files)
124	Built in Job scheduling and workflow
125	Embedded tuning and explain plan support
126	Supports multiple hierarchies
127	Offers impact analysis features.
128	XML as sources and/or targets
129	Handles multiple datatypes (BLOBS/CLOBS, XMLTYPE, etc)
130	Robust notification process, send email, ftp call external processes
131	Be able to utilize CDC functionality of the DB from the tool. (event based I/O queue)
132	Be able to load OLAP/MOLAP as data targets.
133	Should be able to use near real time data / events as feeds for a near real time DW and allows message oriented integration
134	SOA enabled. - Be able to call EJB / Java methods as web services
135	Repository is open architecture an can be queried using standard reporting tools.
136	Built in monitoring and auditing tool (ETL end to end)
137	Load balancing / clustering support
138	The tool should have a reporting tool for reporting the ETL jobs / performance
139	inbuilt Functionality for Parallel Processing
140	inbuilt Functionality for Multi-threaded Engine

141	Ability to handle high volumes of data
142	Low Incremental cost for additional performance (scalable)
143	inbuilt ETL jobs/Sessions Scheduling Capability
144	Supports time-based scheduling
145	Supports event-based scheduling
146	Inbuilt functionality for job logging
147	Metadata based on robust centralized repository
148	tightly aligned with the industry open metadata standards (CWM)
149	Support for multiple languages
150	Inbuilt functionality for version control
151	Provide GUI Based Designing (with easy access to different fictional components)
152	Involves Minimal Programming
153	Provides step through and easy to use debugging functionality
154	High reusability (User defined transforms, reusability of same transform)
155	Bug fixing response time / Support for technical queries
156	Product suppliers' effectiveness on providing support for all new release along with old release
157	Which OS/hardware platforms (and versions) does the server support in production, and in development/QA?
158	On which of these does the server natively support SMP/MMP functions?
159	How is failover implemented?
160	Is the process manual or automatic?
161	What products must be purchased in order to implement failover?
162	How is load balancing among multiple servers implemented?
163	Is the process manual or automatic?
164	What products must be purchased in order to implement load balancing?
165	What platforms are expected to be supported for 64-bit and when are they expected?
166	IS the ETL tool has the ability to support Multithreaded operation and parallel code execution internally?
167	Is the ETL product capable of executing multiple different steps or jobs concurrently?
168	How is security implemented for development purposes? (Access to different projects, functions, etc).
169	Are there any additional products required in order to implement security?
170	Is the security protocols like single sign-on, Kerberos, LDAP supported?
171	Is there any Intermediate Storage support between processing steps?
172	Do you support Web Services?
173	What is web services delivery mechanism do you use?
174	Do you support WSDL & UDDI?
175	What kind of Audit framework supported?
176	Is there a way to restart the ETL jobs from where it last failed?
177	How the real time and near-real time data transfer supported?
178	How the ETL jobs handled for on-demand requirement?
179	What kind of built-in functions supported for Star Schema?
180	Which data access methods does the tool support, including mainframe access, legacy access, connectors to packaged apps, Web services, APIs, ODBC and JDBC?
181	Which special sources like Web logs, RFID data, customer data, XML Schema, etc., are supported?
182	For which database management systems (with version numbers and Platforms) does the product provide native gateways, bulk loader control, and query optimization?

183	Is there any built –in component available to execute SQL statement or Procedures directly in the target repository?
184	How does the tool interoperate with tools for EAI (message brokers or queues), sort, schedulers, data modeling, reporting, etc.?
185	What is the vendor’s approach to data integration services?
186	Which services technologies are supported (Web services, EJB, Message oriented middleware, proprietary)?
187	What kind of CDC techniques used?
188	Is there a CDC mechanism that works with Oracle or equivalent, SQL Server?
189	What are the Adapters supported for Data Transfer?
190	Please describe how team-based development is managed.
191	How the Reusable component feature supported?
192	Where is the transformation source code stored?
193	How is the transformation source code generated?
194	Is it possible to version control the source code? If yes, how is it done?
195	Do you support 3 rd party source code control? For example, clear case, Visual source safe
196	Please provide details on setting up the environmental parameters
197	Please provide more details on the debugging capability associated with the ETL tool and list any products that must be purchased for added debugging capability.
198	Is there a command line support for managing ETL processes/jobs?
199	What is the language used for the development of scripts?
200	How many built-in transformation functions do you have?
201	Do you support user defined functions?
202	How are hand-coded routines handled?
203	How is the meta data captured?
204	• What database does it require/support?
205	• What debugging and test features are supported?
206	DTS, custom XML schema)?
207	Do you support storing meta data in relational databases?
208	Do you support meta data integration with BI tools for example BO, Cognos etc.? Please provide details.
209	Can meta data be integrated with Erwin/ER studio data modeling tool?
211	Is there publish and subscribe capability for meta-data and changes related to meta-data?
212	Are there any additional products required in order to have this capability?
213	How can we monitor ETL jobs?
214	How can we integrate the ETL jobs with monitoring tools like Tivoli, Open View, etc?
215	Is there any built in report feature supported?
216	Is there any feature supported to run a report to show the ETL job execution logs?
217	How is the code deployed between environments for example from development to production?
218	Do you have data profiling capability in your tool?
219	Provide pricing information for data profiling.
220	Do you have data cleansing capability in your tool?
221	Please provide information about Service level agreements, hours of support, standard vs extra cost, consulting, etc.
222	What support does the vendor provide?
223	What third-party support is available?

224	What is the depth of the documentation provided (number of books, paper pages, HTML pages, help topics, disks)? In what languages and formats (paper, CD, HTML, Windows Help) is documentation available?
225	What training does the vendor provide? What third-party training is available?
226	Provide examples of built in standardization support
227	Subject specific (i.e. customer, inventory, vendor) matching/parsing rules?
228	Capable of manipulating source data/staging data structure (create new fields, create new tables etc.) through built-in interface?
229	Describe built-in quality testing and correction library
230	What languages were used to build the product?
231	What databases/ platforms are supported as the execution platform?
232	Are there any software requirements?
233	What are supported sources and targets?
234	What are some of the connectivity protocols used between tiers?
235	What does the development environment look like?
236	What are the different elements in the development environment?
237	What code does the product generate internally?
238	Does the tool automatically map between source tables, or between source and target tables?
239	How is a simple lookup from another table performed?
240	Interactive Dashboards
241	Description: Provides users with a robust interactive experience via dashboards and reports, offering a variety of visualizations.
242	Features:
243	Drill, pivot, and filter data directly on dashboards.
244	Personalized data views based on user roles and security rules.
245	Integration with high-performance systems for large data analysis.
246	Self-Service Data Visualization
247	Description: Empowers users to explore data independently, facilitating the discovery of insights through intuitive visual analysis.
248	Features:
249	Access to a wide range of data anytime and anywhere.
250	Tools for creating visually compelling data representations.
251	Ad Hoc Analysis and Interactive Reporting
252	Description: Provides full ad hoc query and analysis capabilities, allowing users to modify existing projects or start new analyses without needing in-depth knowledge of data structures.
253	Features:
254	Simplified metadata layer providing a logical view of metrics and calculations.
255	Ability to combine data from multiple enterprise information sources.
256	Mobile Analytics
257	Description: Supports mobile devices, enabling users to interact with dashboards, reports, and other analytical content on the go.
258	Features:
259	Secure access to analytics on smartphones and tablets.
260	Mobile app integration for seamless data interaction.
261	Enterprise Reporting
262	Description: Facilitates the creation of highly formatted templates, reports, and documents, optimized for complex and distributed environments.
263	Features:

264	Supports various data sources, including relational, multidimensional, and XML.
265	Tight integration with other analytical tools for easy data transfer to reports.
266	Proactive Detection and Alerts
267	Description: Features a powerful alert engine that operates in near-real-time, capable of triggering workflows based on specific business events.
268	Features:
269	Multichannel notifications, including SMS and email.
270	Integration with workflows to automate business responses.
271	Actionable Intelligence
272	Description: Allows users to take direct actions based on insights generated within analytics tools by integrating business processes.
273	Features:
274	Ability to invoke business processes or web services from within dashboards and reports.
275	Spatial Visualizations and Analytics
276	Description: Provides tools for visualizing spatial data on interactive maps with a variety of customizable options.
277	Description: Provides tools for visualizing spatial data on interactive maps with a variety of customizable options.
278	Interactive map views with support for touch and gesture interactions.
279	Flexible formatting options, including color fills and custom markers.
280	Server-Based Query, Reporting, and Analysis
281	Description: Optimizes queries across multiple data sources, aggregates results efficiently, and presents them through easy-to-use web interfaces.
282	Features:
283	Centralized metadata layer for consistent data management across different sources.
284	Scalable platform with clustering, caching, and high-throughput capabilities.
285	The solution shall identify and prevent misuse of authorised user access.
286	The solution shall have the ability to configure access determined by user, by service, by source IP address.
287	Do Oracle (or equivalent) Database Vault Privilege Analysis has performance overhead on the database?
288	Do Oracle (or equivalent) Database Vault Realms and Command Controls has performance overhead on the database?
289	Can we move Oracle (or equivalent) Database Vault security Policies from a development system to a production system?
290	How does Oracle (or equivalent) Database Vault help address customer compliance requirements?
291	Does Oracle (or equivalent) Database Vault provide any security in the Cloud?
292	Oracle (or equivalent) Database Vault should meet compliance requirements found in Sarbanes-Oxley, PCI, HIPAA, ITAR, and EU privacy laws?
293	DBAs should be prevented from making unauthorized system and session changes in the database?
294	can we apply patches in a Database that is protected by Oracle (or equivalent) Database Vault?
295	Database security software should work from within the RDBMS to enforce the security rules and access controls regardless of the type of client connections to the RDBMS.
296	Database security software should enforce separation of duties and highly privileged database administrators should be prevented from modifying security policies.
297	Database security software should provide a flexible architecture supporting rule definitions through SQL procedures, reuse of rule definitions and security policies.
298	Database security software should prevent users accessing the database from unauthorized IP addresses and should allow user specific policy definitions.

299	Database security software should provide controls on who, when, where and how the database is accessed.
300	Database security software should provide a web-based interface using the HTTPS protocol to manage security policies and security reports for the database access.
301	Database security software should provide an API to define the security rules through SQL procedures.
302	Database security software should provide reports to detect unauthorized access attempts to the database.
303	Database security software should prevent data access from database triggers, stored procedures and functions.
304	Database security software should still enforce security policies in case of network encryption between clients and database server.
305	The solution should be able to support key rotation
306	Does TDE integrate with Oracle (or equivalent) Exadata? If Yes then How TDE integrate with Oracle (or equivalent) Exadata?
307	Can we migrate existing clear data to TDE encrypted data
308	Does TDE support Hardware Security Modules (HSM)?
309	Solution should support industry proven cryptograph security standard: 3DES, AES128, AES256, ARIA128, and ARIA256
310	Key Management and KMIP Should be able to support KMIP client
311	Does TDE help customers comply with Payment Card Industry (PCI) standards, healthcare data privacy laws (U.S. HIPAA/HITECH), and other security regulations
312	What security certifications and validations does TDE have
313	Why do I need to redact sensitive data?
314	Does Oracle (or equivalent) Data Redaction include pre-configured templates?
315	Can We use Oracle (or equivalent) Data Redaction with other common Oracle (or equivalent) Database features?
316	Can we redact databases running in Oracle or equivalent Cloud?
317	How do we manage Oracle (or equivalent) Data Redaction?
318	What is the performance of Oracle (or equivalent) Data Redaction?
319	Is it safe to use Oracle (or equivalent) Data Redaction in a production environment?
320	Is Oracle (or equivalent) Data Redaction transparent to applications? Are application changes required?
321	Does Oracle (or equivalent) Data Redaction change the way applications or application servers connect to the database?
322	Does the DBMS support partitioned indexes?
323	Historical databases must be permanently accessible without additional load from the point of view of the operational system so that historical queries do not affect the smooth operation of the operational process. Also, access to historical databases must be transparent from the application point of view of the user;
324	Provide support for partitioning of tables and indexes according to predefined criteria by system administrators;
325	Ensure data segmentation mechanisms for all databases, over time defined by system administrators
326	Partitioning of data must be possible after at least the following criteria: interval, hash and list, and the ability to partition tables linked by foreign-key so that the child table can be partitioned using the partitioning criteria used in the parent table, "without having to replicate the partition key in the child's table";
327	For ease of administration of the database, an automatic mechanism for creating new partitions, based on a predefined interval by the administrator, should be provided as the data is entered into the table;
328	Used to scale large DBMSs using standard partitions, such as date range. Is this feature an extra cost?
329	Does RDBMS support hybrid partitioned indexes for VLDB?

330	The RDBMS should provide the administrator (DBA) with GUI based administration console. The administration console should be a web-based application accessed through a web browser and should not require an installation on the clients.
331	Performance information of the RDBMS and the hardware (CPU, memory, etc.) on which the RDBMS is running should be monitored in real time and performance bottlenecks should be detected automatically.
332	The performance data of the RDBMS should be produced and recorded periodically and if necessary, automatic performance analysis should be performed.
333	In the RDBMS, query sentences that cause the highest load should be listed according to certain criteria and solutions should be suggested to solve the performance problems.
334	Alert levels can be determined for values related to RDBMS and system performance and warnings should be transmitted automatically if these values are exceeded.
335	The RDBMS should be able to make suggestions for change in the performance of problem SQL queries, calculate the expected performance increase after these changes, and apply the proposed change with the same tool.
336	The RDBMS should provide structural change proposals (new index creation, removal of unused indexes, summary tables etc.) to improve database performance and should be able to sort these proposals according to expected improvement rate and apply the proposed with the same tool.
337	A tool to help the DBA decide on the type of partitioning to use based on the schema of the database and query statistics. These should use both query analysis and data profile (domain) analysis as access metrics based on queries are often ignored. Please explain in the comments.
338	Is there a diagnostic tool available?
339	Is there a tuning tool available?
340	Please provide full details of the system performance administration facilities available and indicate the extent to which these are automated.
341	Is there a session history tool available?