To meet individual customer requirements Fujitsu has defined several configurations to enable optimum operation of data warehouses. They are easy to operate, maintain and expand.

Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>From XS to L – Configurations for every size</td>
<td>3</td>
</tr>
<tr>
<td>Building Blocks of the Oracle Warehouse Infrastructure</td>
<td>4</td>
</tr>
<tr>
<td>from Fujitsu</td>
<td></td>
</tr>
<tr>
<td>End-to-end Service for your Oracle Warehouse Infrastructure</td>
<td>6</td>
</tr>
<tr>
<td>Fujitsu and Oracle</td>
<td>7</td>
</tr>
</tbody>
</table>
Introduction

Optimum Operation of Data Warehouses
Data warehouses are growing in importance because today’s enterprises need fast access to exact and reliable information to put decision-making on a simpler and more secure basis. Of course, having the ability to supply data in real time also increases the demands placed on system performance and data throughput. The fact that data warehouse environments are constantly changing and growing also necessitates runtime environments that scale easily and flexibly.

Designing and building data warehouses that are reliable, highly available, scalable, low-cost, flexible and adaptable and offer high performance – that can require long-term, work-intensive projects. However, long infrastructure projects are no longer acceptable in a time when business processes are changing so rapidly. Enterprises need low-cost, powerful solutions that can be provisioned quickly to give them significant value and competitive advantages. That is why Fujitsu has defined several configurations to enable optimum operation of data warehouses. They are easy to operate, maintain and expand, and they meet a variety of customer needs. Based on a best-practice approach, the Oracle Warehouse Infrastructure from Fujitsu bundles software, hardware, storage, I/O and the network in packages tailored to satisfy different business process needs. All packages have been carefully tested and examined by our experts.

The Oracle Warehouse Infrastructure from Fujitsu allows enterprises to focus fully on leveraging their data optimally – at an unbeatable price.

Why Best Practice Configurations for Oracle Warehouses?
The Oracle Warehouse Infrastructure from Fujitsu is available in four configurations. They are pre-installed and ready for immediate operation. The configurations have been defined using a best-practice approach. All infrastructure components have been put together on the basis of a needs analysis of different enterprises relating to performance, reliability, cost-effectiveness and the scalability of data warehouses.

Each configuration contains storage, servers and Oracle Database Enterprise Edition (version 10g and above), as well as Oracle Partitioning and Oracle Real Application Clusters (RAC). As an option, the systems can also be equipped with Oracle Business Intelligence Suite Enterprise Edition Plus and Oracle Data Integrator. The configurations of Oracle Warehouse Infrastructure from Fujitsu guarantee high-performance operation of a data warehouse. The use of low-cost, industry-standard servers with Linux as the operating system and an intelligent storage area network (SAN) help the best-practice configurations slash total cost of ownership (TCO).

The servers are operated in a cluster with Oracle Real Application Clusters (RAC) to enable the highest possible performance and scalability. That makes it possible to start off with a configuration that precisely matches the customer’s current needs. If it becomes desirable later, users can easily expand the configuration and move up to the next reference configuration. Customers benefit from this pay-as-you-grow approach and have the assurance that there will be no discontinuity in their configuration’s components if their requirements increase.
From XS to L – Configurations for every size

Best Practice Configurations

We have developed best-practice configurations – named like T-shirt sizes – for different customer needs. All the components are tuned to interact optimally and ensure the highest possible throughput.

The best-practice configurations are defined as follows:

- **XS**: Extra-Small configuration up to a database size of 8 TB
- **S**: Small configuration up to a database size of 13,5 TB
- **M**: Medium-sized configuration up to a database size of 27 TB
- **L**: Large configuration up to a database size of 54 TB

Entry-level Configuration

In addition, there is a very small, attractively priced entry-level configuration for Oracle warehouses with a database size of up to 5.4 TB. In this configuration, the Oracle Standard Edition database is pre-installed – without partitioning.

The core hardware components in the configurations are:

- PRIMERGY RX300 S6 rack server with Linux
- ETERNUS DX80 SAN storage system.

The configurations use Brocade 300 or 5100 Fibre Channel (FC) switches for connection to the storage systems. 8Gb technology is deployed so that the storage can be used transparently. This technology has been certified for ETERNUS DX80 SAN storage systems and ensures that each PRIMERGY RX300 server is supplied with 1600 MBytes (2 x 800 MBytes) of data per second via the Brocade FC switches. That means that 1 TB of data can be accessed in about 10 minutes.

On the cluster configurations the Oracle database is installed with RAC so it can be accessed from more than one server.

End-to-end high availability is ensured by the redundant design of all hardware:

- 2 FC controllers (HBA) in PRIMERGY RX300 S6 servers
- 2 Brocade 300 or 5100 FC switches with separate fabrics
- 2 FC storage processors in ETERNUS DX80, 2 HBAs per processor (active, passive)
- Redundant hard disks thanks to RAID 1 technology (mirror)

This hardware concept allows the solution to be expanded easily to permit disaster recovery:

- Storage-based, by means of snapshots, or
- Oracle-based, by means of redo logs.

Servers or storage can be added seamlessly to all the configurations, and gentle transition to the next-sized best-practice configuration is guaranteed. And, of course, the high throughput is retained after migration to the next configuration size since a balanced relationship between RAC instances and storage size is always ensured.
Building Blocks of the Oracle Warehouse Infrastructure from Fujitsu

PRIMERGY RX300 – to meet highest demands
The PRIMERGY RX Rack Server family is the perfect platform to form dynamic infrastructures for your business processes today and in the coming decade. You will thus benefit several times over from our recognized experience in optimized data center technology and our innovative strength in developing energy-efficient and cost-performance-optimized rack systems for universal use. PRIMERGY rack servers, built upon industry standards, focus from a functional viewpoint on core features: energy efficiency, reliability, optimized for virtualization, ease of operation and maintenance, flexibility for your future. And thus they notably meet your requirements for outstanding cost efficiency. Optimal operating costs and long-term usability comply with the IT quality required by your customers. Our responsibility goes way beyond the hardware as our tailor-made service packages mean that you can rely on the best support for your IT during its whole lifecycle.

PRIMERGY RX300 – S6
The consolidation of dedicated servers and the use of efficient virtualized run environments provide measurable benefits and new flexibility regarding IT operations management. Virtual servers can thus be moved to other servers during ongoing operations and enable maintenance work to the hardware platform without any operational interruption. Active virtual servers can be flexibly moved to systems with higher performance for operation during peak-load times. Test systems can be very easily converted via live migration to production systems.

Virtualized environments are the top application for RX300 systems and their new multicore CPUs in the Intel® Xeon® 5600 series. In this situation, several operating systems plus the installed applications have to run simultaneously on one and the same physical hardware. RX300 S6 provides all the platform features required for efficient virtualization:

- High, scalable I/O performances with PCIe Gen2, x4/x8 Turbo mode, up to 7 free PCIe slots - so that disk I/O and network/SAN accesses do not become a bottleneck!
- The generosity of the maximum 192 GB main memory for a high-performance determinable, optimal sizing of the virtual server environment so that the main memory does not become the point of contention for the virtualization software as well as the consolidated applications and the operating systems.
- Top performance with state-of-the-art Dual Quad or Turbo Quad-Core Intel® Xeon® 5600 series CPUs as well as double I/O performance with PCIe Gen2.0 - so that every virtual system can work at a higher performance level than before.
- The reliability of a premium server system in a space-saving 2 U design so that the cost benefits arising from standardized rack servers and virtual systems do not become a survival risk!

The reliability of the RX300 server platform also leaves nothing to be desired as database servers or application servers for Data Warehouse Applications and business-critical processes.
ETERNUS DX80 – Reliable Storage Solution for Dynamic Infrastructures

The new ETERNUS DX80 will continue the success story in the entry segment and set new standards. The ETERNUS DX80 offers quality and reliability.

The system supports all relevant RAID levels (0, 1, 5, 1+0, 5+0, 6) and features like RAID migration to migrate data dynamically between disks or Data Block Guard to ensure data integrity. Instead of traditional batteries the CacheProtector feature uses capacitors to write the content of the RAID controller cache to a flash memory in case of power failure. Redundant Copy reduces dramatically recovery time and minimizes the risk of permanent data loss. All these features make the ETERNUS DX80 the most reliable storage system of its class. The energy saving storage device can be scaled from 600 GB to 120 TB and is equipped with all state-of-the-art capacities of high-performance SAS and large capacity Nearline SAS Disks.

The standard system is delivered with 8 snapshots and can be extended to 1,024 snapshots. The ETERNUS DX80 has four 8 Gb/s or alternatively 4 Gb/s Fibre Channel host ports and can connect up to 128 servers in SAN mode.

End-to-end service for your Oracle Warehouse Infrastructure

We offer you a comprehensive range of services for planning, implementing and operating your Oracle Warehouse Infrastructure. Our services are not restricted to just technology and technological support – they also cover the analysis of the economic impact you can expect in your enterprise with our Oracle Warehouse Infrastructure. A team of experts from Fujitsu with in-depth Oracle know-how is available to assist you.

The following Professional Services are offered for the Oracle Warehouse Infrastructure:

Professional Services from Fujitsu

Strategy Workshop
The link between your business and your IT strategy. Our consultants concretize your IT strategy with a future-oriented infrastructure strategy for data warehousing that takes into account economic and qualitative aspects alike. The basis for this is your customer specific business requirements and the experience of our strategic IT consultants.

Configuration & Sizing
IT optimization should be based on your concrete reality, not on someone’s standard lists. We work with you to ascertain these facts methodically. That gives you a reliable basis on which to decide which best-practice configuration is the best fit for your company.

Solution Concept
Alternative concepts and a proposed solution are formulated on the basis of a systematic analysis of requirements and objectives. The concept also describes the transition from the current IT infrastructure to the future IT landscape.

Proof of Concept
Test your solution concept using a cutting-edge infrastructure and the know-how of the specialists for IT optimization. Implementation of a prototype reveals whether the solution meets your requirements regarding functionality, ease of handling, performance, availability, etc.
End-to-end Service for your Oracle Warehouse Infrastructure

Solution Implementation
This phase comprises installation and configuration of all components and a check for correct implementation.

Operational Implementation
Knowledge transfer and training are key to enabling smooth operation of your Oracle Warehouse Infrastructure from Fujitsu. We ensure this by documenting its implementation and giving system administrators extensive training.

Go Live Services
Innovation only pays off for your enterprise if you can work with it. With our Go Live Services, we ensure that the optimizations you aim for are also actually achieved in practice. Among other things, we support you with inspections and proactive services in putting your Oracle warehouse into productive operation.

Coaching and Trainings
Customized training in your Oracle warehouse configuration is possible in the following form, for example:
- On-the-job training in order to guarantee smooth use from day one.
- Coaching until users are familiar with all processes.

Solution Support
Our round-the-clock full service for your Oracle warehouse configuration is the right place to contact if you have any problems.

Operational Service
Our support for secure and efficient operation includes "health checks" that supply information on status, trends and problems, as well as upgrade support.

ROI-ESTIMATE™
We deliver the proof that an Oracle warehouse project based on best-practice configurations makes sense and brings the desired return on investment (ROI). ROI-ESTIMATE™ allows you to estimate the financial impact of your IT project reliably at an early stage during the consulting phase.

ROI-PREDICT™
ROI-PREDICT™ adds precision to the ROI forecasts and creates the foundation for measuring how all partners contribute to the project’s success; it is used during the design phase and is based on the solution specifications.

ROI-DELIVER™
ROI-DELIVER™ verifies the forecasts in the course of the project and subjects the ROI forecasts to subsequent review based on the delivered solution.
Fujitsu and Oracle

Oracle, the world’s second largest independent software vendor, and Fujitsu, the leading European IT vendor, have been cooperating closely for more than two decades.

Together with Oracle, we offer our customers outstanding application performance, unlimited scalability, fault tolerance and optimal security. This is ensured by products and services that are fully compatible with and integrated in our technology.

Fujitsu is an Oracle Certified Advantage Partner and the only company to support three of Oracle’s five strategic development platforms: Linux, Windows and Solaris on SPARC enterprise servers and Intel-based PRIMERGY servers.

Fujitsu maintains several technical centers together with Oracle. This offers customers the chance to meet with experts from both companies there. Customers can also use the technical centers to take part in free workshops – for example, to obtain assistance in migrating existing solutions.

More Information

You can find out more about our products and solutions and how to benefit from the cooperation between Fujitsu and Oracle at:

- ts.fujitsu.com/oracle
- ts.fujitsu.com/solutions/strategic_partners/oracle/warehouse.html
- ts.fujitsu.com/casestudies

Or simply send us an e-mail: oracle.team@ts.fujitsu.com