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DB-2

Editorial Team

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INTRODUCTION

Government of Gujarat has already commissioned many important ICT projects in the state and it is still going further. In all the projects Database is playing vital role. There are many database products available in the market like Oracle (9i & 10g), DB2, Microsoft SQL, MySQL, MS Access etc. Most of the Departments are using either one of the above mentioned Database product. In our earlier News Letters we have covered Oracle and SQL Server. In this news letter we have covered overview and features of DB2.

IBM's DB2 Server is a collection of products which provide powerful database management on a variety of platforms including OS/2, Windows NT, AIX, HP-UX, Sun Solaris and LINUX operating systems. It is a true client-server architecture allowing the databases to exist on a server machine with application development from a client toolset.

Overview - DB 2

- IBM introduced its first relational database system SQL/DS in 1981 supported by the database language SQL (Structured Query Language). SQL/DS was followed in 1983 by the DB2 product under the IBM MVS mainframe systems. This product has grown over the years with a current version DB2 Common Server running on the above platforms and specifically on IBM's AIX Unix and Sun Solaris operating systems at VCU.

- DB2 Universal Database (DB2 UDB) Version 8.2 delivers new features to address the ever-increasing demands and requirements on the most important data: our customer's. DB2 UDB Version 8.2 provides new functionality to assist and resolve challenges that you, the customer, experience each day.

- Database Administrators can reap immediate benefits from the broadened autonomic (also known as self-managing) computing solutions offered in DB2 UDB Version 8.2. These solutions automate and simplify potentially time consuming and complex database tasks. For example, this release simplifies performance optimization for specific workloads by introducing the Design Advisor, a self-configuring tool that automates database design.

- DBAs in Business Intelligence environments can take advantage of several DB2 UDB Version 8.2 features including runstats enhancements and online import. RUNSTATS now exploits page and row-level sampling for faster statistics gathering. Faster statistics processing means more frequent updates are feasible, resulting in better optimizer plans and faster BI queries. This feature is used by DB2 in recent TPC-H benchmark results. The Online Import Utility exploits fine-grained locking for greater concurrency in online table loads. It can be applied to trickle-feeding a real-time warehouse.

- For application developers, DB2 UDB Version 8.2 delivers a significant amount of new capabilities as well as further integration of DB2 tooling into the Microsoft(R) .NET and WebSphere Studio/Java environments. This simplifies the development and deployment of DB2 applications allowing application developers to take advantage of the openness, performance and scalability of DB2, without regard to the back-end database or the chosen application architecture.

- IT managers and DBAs will benefit from the integration of industry proven high availability disaster recovery (HADR) technology available in DB2 UDB Version 8.2. Line of business managers and the enterprise itself, benefit the most as critical applications face less risk of downtime. HADR technology will help to ensure that the enterprise is business-enabled, around-the-clock without requiring time-consuming application changes.

- DBAs and security administrators can provide greater security for their information assets by utilizing the pluggable security architecture. Custom security plug-ins allows DB2 to be plugged into any security scheme that utilizes User IDs and Passwords for authentication, and User IDs and group membership to implement authorities. Integrating DB2 into environments utilizing a Windows(R) security schema has been made easier by improving support for Active Directory.

- Regardless of your role or the size of your business, DB2 UDB Version 8.2 has exciting new features that can assist you with your daily challenges. Read on to learn more about these new features.

Key Enhancements

DB2 UDB, V8.2 builds on its market-proven industrial strength and on demand capabilities with the following key enhancements:

- **Reduces deployment and management costs**

The Design Advisor helps by suggesting design alternatives for advanced features like materialized query tables, multi-dimensional data clustering, partitioning, and indexing data. In tests conducted by IBM on a common complex query workload with one terabyte of data, Design Advisor was able to increase the performance of an un-tuned database by 84%.

DB2 will now automate key maintenance activities based on business policies. Among the tasks that can now be automated are database backups, data defragmentation (table or index reorganization), and data access optimization (collecting statistics).

- **Increases programmer productivity**

DB2 is delivering a variety of plug-ins, like database object manipulation and integrated help, to the Eclipse framework to allow developers to easily and efficiently interact with DB2.

Building on an already extensive integration with Visual Studio, DB2 is now the first relational database to support stored procedures written in Microsoft's Common Language Runtime (CLR) compliant languages such as Visual Basic and C#.

There are numerous improvements to the DB2 Universal JDBC Driver for V8.2, including distributed transaction or JTA support, connection pooling support and JDBC 3.0 compliance. Other new features increase the flexibility of integrator use in SQLJ and enhance interactivity with host and iSeries databases.

- **Provides a robust infrastructure**

High Availability Disaster Recovery (HADR) provides a new alternative for delivering a high-availability solution by replicating data which includes a wizard allowing complete configuration in minutes. Combined with the new client reroute capability, HADR masks any failures from applications allowing uninterrupted access to data.

DB2 continues to invest in the Linux platform and now supports distributions based on the new 2.6 kernel. Exploitation of new I/O and memory management features found in the latest Linux distributions is provided, including a variety of 64-bit platforms like Intel, POWER, and zSeries.

DB2 UDB Enterprise Server Edition

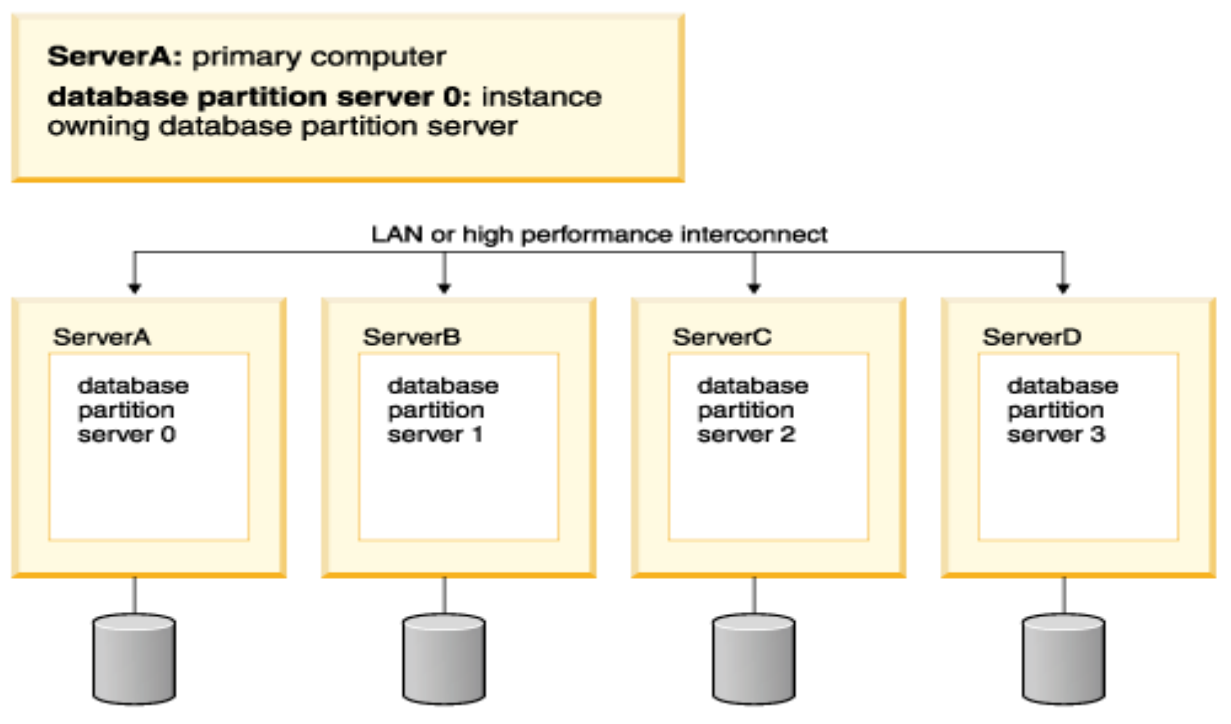
DB2(R) Universal Database (UDB) Enterprise Server Edition (ESE) is a multi-user version of DB2 that allows you to create and manage single-partitioned or partitioned database environments. Partitioned database systems can manage high volumes of data and provide benefits such as increased performance and high availability. Other features of DB2 UDB Enterprise Server Edition include:

- A data warehouse server and related components.
- DB2 Connect(TM) functionality for accessing data stored on midrange and mainframe database systems such as DB2 for iSeries(TM) or DB2 UDB for z/OS(TM) and OS/390(R). DB2 UDB Enterprise Server Edition provides support for both local and remote DB2 clients.
- Use of the DB2 Connect component is limited to five (5) registered users per server. If additional users are required, a separate DB2 Connect program must be acquired. Contact your IBM(R) sales representative for more information.
- Satellite administration capabilities allow DB2 UDB ESE to remotely administer DB2 UDB Personal Edition and DB2 UDB Workgroup Server Edition database servers that are configured as satellites. For more information about satellite capabilities, refer to the satellite administration documentation.

DB2 UDB Workgroup edition offers a multi-user product similar to DB2 UDB ESE, but without the ability to create partitioned database environments and without DB2 Connect functionality.

The following diagram shows a DB2 UDB ESE configuration with four database partition servers, one per computer. Setup instructions are based on this configuration but can easily be adjusted for partitioned configurations with a fewer or greater number of computers and database partition servers.

Figure 1. A typical partitioned DB2 server environment with one instance owning computer and four participating computers



ServerA is the primary or instance-owning computer. ServerB, ServerC, and ServerD are additional participating computers.

Features

DB2 Universal Database (UDB) comes with some very powerful features that include:

- An expansion of the SQL language with new features such as recursive queries.
- A collection of object-oriented features to allow storage of complex objects up to two gigabytes to hold text, pictures, voice, and mixed media.
- Active data features such as constraints and triggers which allow restrictions on the database tables themselves. This provides an extremely useful methodology to define restrictions against a field or table or even a restriction on one table against another.
- Client interfaces through Open Database Connectivity (ODBC), thus allowing development and analysis through personnel computer interface programs such as Microsoft Access, Visual Basic, FoxPro, PowerBuilder, Delphi, SAS, SPSS or any other ODBC capable product.
- Web database access using CGI scripts written in Perl, "C", and other programming languages as well as support for Java and XML.
- At the server level, DB2 may be accessed from a variety of programs including: SAS, "C", Fortran, Cobol, and Perl.

User Departments

DB2 usage in GoG:

1 E-Databank – Department of Science and Technology

Goal:

The goal of this project is to develop an e-databank which will be a single point of contact for the stakeholders to access the services online and a centralized repository for information across Government of Gujarat. Information available in this repository will be accessed through a portal which will be single point of contact for various stakeholders.

Objectives:

The objective of this project is to provide improved services to its stakeholders. Over and above the existing channels of services, providing on-line services over internet would provide transparent and efficient delivery of services.

Scope of the Project

The scope of this project will be limited to 5 Services from each of the following 12 departments during the First Phase of the Project:

Department of Agriculture
Department of Cooperation
Department of Education
Department of Food & Civil Supplies
Department of Health & Family Welfare
Department of Industries & Mines
Department of Labor & Employment
Department of Panchayat
Department of Revenue
Department of Rural Development and Rural Housing
Department of Social Justice and Empowerment
Department of Urban Development & Urban Housing

The geographic scope for the first phase of the e-Databank portal will be implemented at a single location – Gandhinagar, Gujarat. This project will only add a new channel to the existing government processes, no workflow implementations will not be taken up in this phase.

eGovernance News

Gujarat at Conflux, 2005

Conflux 2005 was a three day conference and exhibition organized by Centre for Science Development and Media Studies (CSDMS) in collaboration with Government of National Capital Territory of Delhi. The objective of the event was to showcase e-Government developments in India and the Asia Pacific and learn from the successful practices in the region. The conference program served as a platform to bring experts from the various countries, key government representatives, industry and academia together to discuss the issues and priorities on the subject. The participants were able to demonstrate their initiatives, take feedback from the community and learn about the processes, technologies and solutions which can address their concerns. The three key stakeholders in e-Government program implementation-the government, private and the NGO sector shared their successes, failures and opportunities during the conference.

Conflux 2005 was designed to help attendees address these challenges and provides practical, actionable knowledge through sharing of better learning practices, presentation on e-Government case studies from various Indian states and also from other Asian countries.

On Day II (October 18, 2005), there were two presentations done by Gujarat as follows:

1) Shri J.N.Singh, Secretary (Department of Science & Technology), Govt. Of Gujarat made a presentation on State e- Governance Plans (under NeGP) in the presence and interacting with the following persons.

State e-Governance Plans

- **(Chair) J. Satyanarayana**, CEO, National Institute of Smart Government, Hyderabad
- **(Co-Chair) S P S Grover**, Senior Director, Oracle
- **J. N. Singh** , Secretary-DST, Gujarat
- **S N Tripathy**, Secretary-IT, Orissa
- **Dr. V Prithvi Ra**j, Director-IT, Govt. of Pondicherry
- **Narsing Rao**,, Secretary-IT & C Govt. of AP
- **Ram Sewak Sharma,** Secretary-IT, Govt. of Jharkhand
- **G Sethuraman,** IBM Consulting Services

2) Neeta Shah, Director (e-Governance), Gujarat Informatics Limited, made presentation on Village Information System (VIS) Project, which is part of the ICTD Initiative of UNDP/ NISG in the presence and interacting with following persons:

UNDP-ICTD Projects

- **(Chair) Pradeep Sharma**, UNDP, India
- **(Co-Chair) J. Satyanarayana**, CEO, NISG, Hyderabad
- **Neeta Shah,** Director (e-Governance), Gujarat
- **Ranjit Kr Maiti**, Joint Secretary, Panchayat and Rural Development Department, Govt. of West Bengal
- **Reshma Anand**, Tarahaat, Development Alternatives
- **Manoj Solanki**, Kutch Nav Nirman Abhiyan
- **P Ram Gopal**, Byrraju Foundation

The Web-Enabled Government Program Advisory Board of eminent e-Government experts and senior central government officers guides and supports the development of the Conflux 2005 conference program to ensure a relevant, first quality program that meets the capacity building needs of public sector participants. The Program Advisory Board members fulfilled this role by participating in periodic meetings, making recommendations about the program theme, session topics and speakers, and identifying organizations that would benefit from conference participation. The event program was designed to help public sector managers' plan, implement and monitor e-Government projects.

WEB CORNER

Draft IT Incentive Policy of GoG

http://gswan.gov.in/IT%20-%20Policy.htm

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