



Information On Demand

Beyond DB2 Viper

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ON DEMAND BUSINESS™

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DB2 Viper 2

■ Key Highlights of Viper 2

– Simplified Management

- *Integrated workload management*
- *Simplified memory management and increased customization capabilities*

– Business Critical Reliability

- *Greater flexibility and granularity in security, auditing & access control*
- *Hands off failover*

– Agile XML development

- *Increased integration between relational and XML functionality*
- *Dynamic XML environments with schema evolution and new XSLT support*

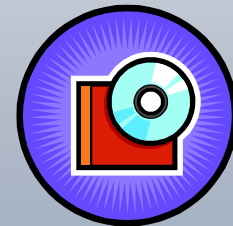
Simplified Management: Installation

- ***Non-root Installation***

- Capability to install and service a non-root DB2 on Unix or Linux
- Some root based features (eg OS authentication) would have to be enabled post-install by a root user

- ***Fix Pack Installation***

- New non-root installations will not require the instance update phase
- Automatic execution of db2iupdt and dasupdt after a fix pack has been deployed
- Automatic binding of packages against the database using auto rebind for all utilities



Simplified Management: Administration Console

- **Web Based Operational Console Model**
 - Focus will be on operational administration and problem determination
 - DB2 for Linux, Unix, Windows; DB2 for z/OS; and IDS are all supported

The screenshot shows the IBM Information Management Console web interface. The main content area is titled 'System Health' and contains a table of alerts. The table has columns for Message, Location, System, Instance, Database, and Timestamp. Below the table, there are sections for 'System Metrics' and 'Transaction Activities'.

Alerts	Message	Location	System	Instance	Database	Timestamp
Alerts	Table space utilization	San Jose, CA	DB_CT1	DB2	DB_CT1	14:01:36 06/03/2006
	% Usage Peak	Buffalo, NY	DB_PROD	DB2	DB_PROD	12:22:03 06/02/2006
	% Usage Peak	New York, NY	SAMPLE	DB2	SAMPLE	12:01:36 06/02/2006
	Table space utilization	Somers, NY	DB_TEST1	TEST	DB_TEST1	07:06:32 06/02/2006
	Table space utilization	Raleigh, NC	DB_TEST2	TEST	DB_TEST2	11:45:23 06/01/2006
	% Disk Read Time	San Jose, CA	DB_TEST3	TEST	DB_TEST3	11:33:44 06/01/2006
	% Usage Peak	San Jose, CA	DB_CT2	CT	DB_CT2	10:25:55 06/01/2006
	Table space utilization	Raleigh, NC	DB_CT3	CT	DB_CT3	10:52:12 06/01/2006
	Disk Read Queue Length	Raleigh, NC	DB_CT4	CT	DB_CT4	17:28:51 06/03/2006
	Disk Read Queue Length	San Jose, CA	DB_CT5	CT	DB_CT5	15:22:02 06/03/2006
	Disk Write Bytes/sec	San Jose, CA	DB_CT6	CT	DB_CT6	14:18:08 06/02/2006
	Disk Write Bytes/sec	New York, NY	DB_CTL1	CTL	DB_CTL1	14:12:16 06/01/2006
	Disk Write Bytes/sec	Toronto, ON	DB_CTL2	CTL	DB_CTL2	13:05:21 06/01/2006
	Disk Read Queue Length	San Jose, CA	DB_CTL3	CTL	DB_CTL3	11:03:18 05/31/2006

- **Control Center**
 - Still available but strategic direction will be operational console



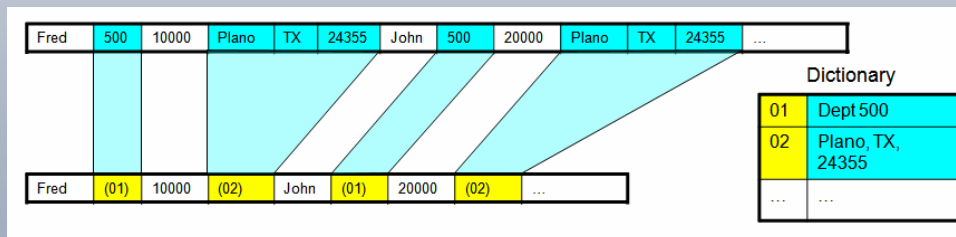
Simplified Management: Improvements

- **Single system view for Database Partition Facility**
 - Single command to backup databases and update configurations on all partitions
- **Automate deletion of obsolete backup images and log files**
 - Enhanced prune operation that deletes expired backup images and log files
- **Automatic Backup Enhancements**
 - Compression
 - Incremental and delta backups
 - Logs in backup
 - Programmable interface to specify, install, and manipulate the backup policy
- **Fully integrated flash copy support**
 - Automate the manual steps currently required for backup and restore with flash copy
- **Automatic Storage Enhancements**
 - Allow user to free unused space at the end table

Simplified Management: Compression

▪ *Enhanced row compression*

- Automatic Compression Enabled
 - Once a predetermined table size is reached (default ~1M), a dictionary is automatically created based on sampling and data
 - All data that is inserted or accessed after the dictionary creation will be compressed
- Removes need for DBA to manually run INSPECT or reorganize all tables
- Dictionary creation will occur on a predetermined trigger point
 - DB2_ROWCOMP_ADCTHRESH – Threshold in bytes (K, M, G, T)
 - DB2_ROWCOMP_MINPCT – Minimum percentage of user data in the table required before compressing



Simplified Management: Workload Management and Monitoring Foundation

- ***New Workload Management built into the DB2 Engine allows you to monitor and control your database based on the needs of your business***

- ***Introduce concept of a Service Class, Workload, Work Action Set, Concurrency and Database Activity Limits, into DB2***
 - **Service Class**
 - User defined entity that acts as a point of resource control and activity monitoring for a set of database activities
 - **Workload**
 - User defined entity used to identify and manage a set of work
 - **Work Action Sets**
 - A user defined entity that is used to discriminate between database activities for service class mapping and activity limit assignment
 - **Thresholds**
 - Control can be handled both proactively and reactively
 - Concurrency Thresholds
 - Database Activity Thresholds

- ***Query Patroller continues to be supported but evolving to this model***

Simplified Management: Workload Management and Monitoring Foundation

▪ ***Monitoring and Control***

– **New table functions**

- To allow quick ad hoc access to internal information via SQL from service classes and workload occurrences
- Can provide information from one or more database partitions with one invocation
- Type of information: statistics and current activities

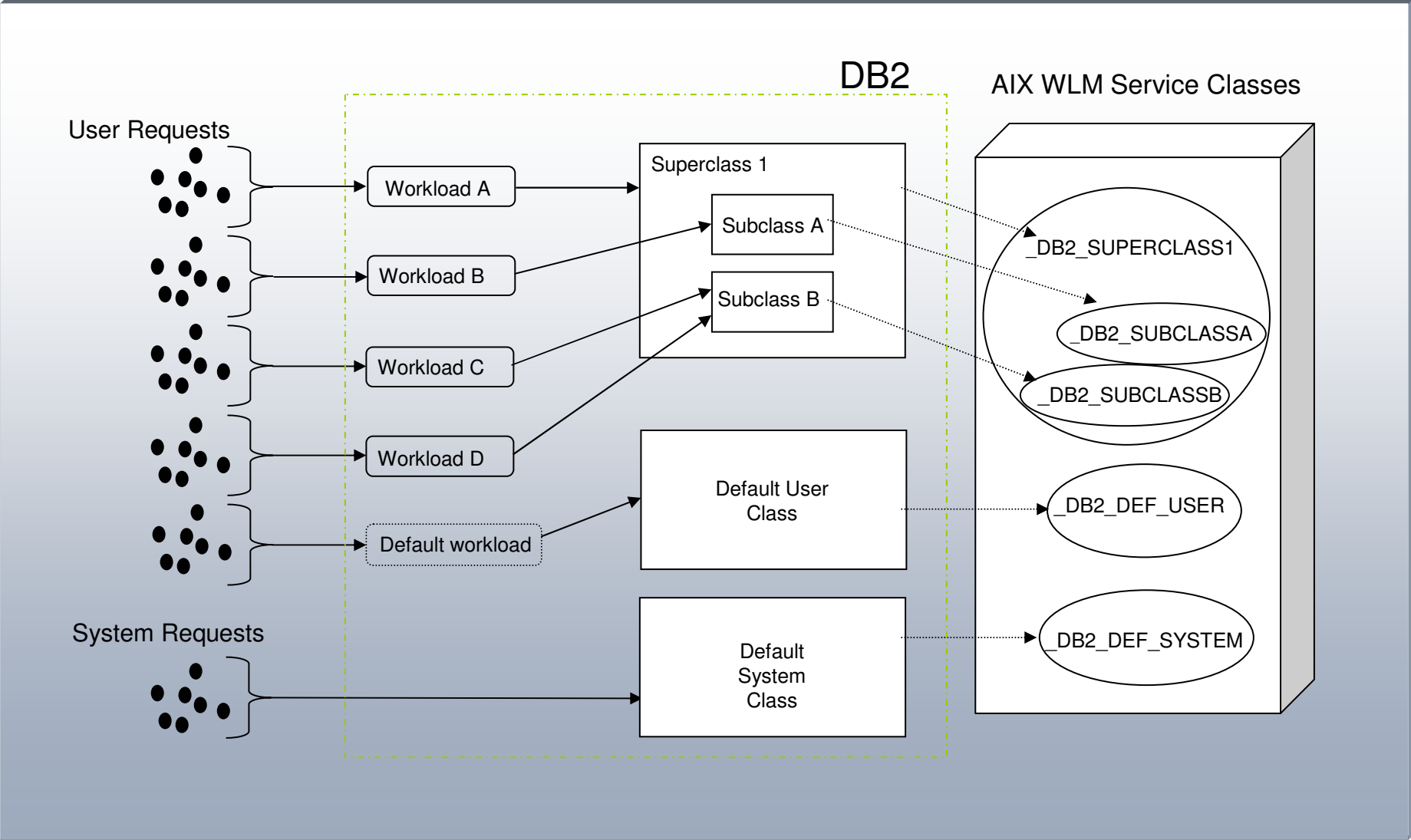
– **New event monitors**

- To allow capture of detailed information of SQL statements from database or service classes
- To allow capture of detailed information of SQL statements from activity limits (via CAPTURE key word)
- To allow capture of service class statistical information at regular intervals

– **New stored procedures**

- To cancel a database activity
- To capture detailed information on a database activity (i.e. SQL statement)

Simplified Management: Example of Workload Management



Simplified Management: Improved Problem Determination

- ***Focus on top 10 SQL Codes***
 - Improve error messages, filtering and error information for top 10 SQL codes (eg SQL1042)
- ***Improve Diagnostic Messages***
 - Improve message and information for top 50 db2diag and admin log messages
- ***Dramatically improve the Problem Determination Guide***
 - Document investigation scenarios in detail (eg how to investigate a memory leak)
 - Document the basic OS based problem determination tools (eg truss, pstack)
- ***Consolidate data collection tools***
 - Provide standard set of tools and enhance around investigation scenarios

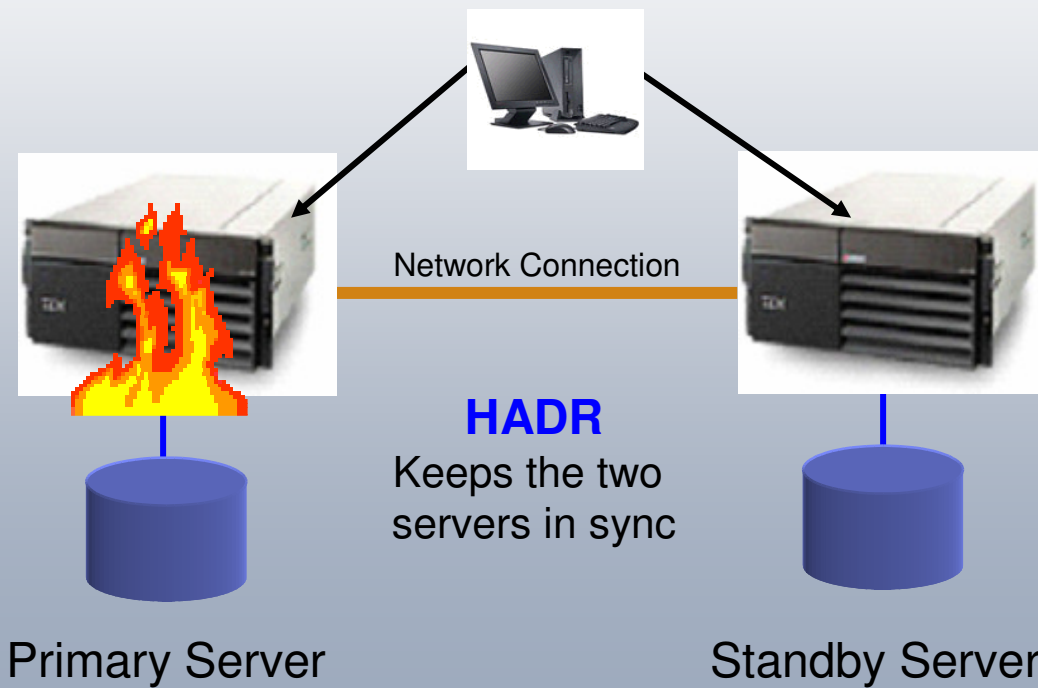
Simplified Management: Security & Regulatory Compliance

▪ **Enhancements to Audit Facility**

- Dramatically improved performance and reduced run-time impact
- Easier and more robust audit capabilities
 - New Audit records for the actual execution of dynamic and static SQL statements complete with SQL text with compilation environment (where appropriate) and, optionally, input data values
 - Improvements to the audit log file infrastructure to support configuration of location and maximum file size (i.e. audit will automatically move to a new file when the maximum is reached on the current file)
 - Fine grained audit control based on
 - inclusion lists of user, group, or role authorization IDs
 - table object based audit indicators
 - trusted context audit indicator
- Increased family compatibility with DB2 for zOS with audit information

Business Critical Reliability: Simple and Robust HA

- **Integrated High Availability and Disaster Recovery solution (automated takeover)**
 - Support integrated install, setup, maintenance and uninstall of Tivoli System Automation (TSA) with DB2
 - DB2 will maintain the cluster configuration of TSA for both HADR and non-HADR failover scenarios



Business Critical Reliability: Scalability and Performance

- ***Threaded engine architecture***
 - Eliminate most agent-level configuration parameters
 - Automate remainder (maxagents, numpoolagents, numinitagents)
 - Provide basic execution parallelism on DB2 LUW servers independent of server type
 - Provide a single memory parameter for an entire DB2 node. This will control total memory allocated in DBMS, DB, and private memory.

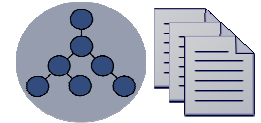
- ***Just in Time Statistics***
 - JITS will provide the on-line statistics needed by query optimizer
 - It will analyze the query, discover statistics which are beneficial for the query which don't exist and collect them before optimizing the query to help optimizer to generate a good access plan

- ***Faster MDC Rollout***
 - Index maintenance for the deleted rows can take too long
 - New delete processing cleans up the indexes as a background process

Business Critical Reliability: Scalability, Availability and Performance

- ***Faster Offline Redistribute***
 - Performance: Improve overall end to end performance.
 - Active Log Space requirement: Significantly reduce active log space requirement without requiring extra container storage.
 - Usability: Introduce table level control and improve progress monitoring during redistribution.

- ***Improve Query Performance Stability***
 - Avoid risky plans through specific heuristics
 - Improved Cardinality Estimation



Agile XML: Improvements

- **XML Functions**
 - XMLRow: Publish rows as a sequence of elements
 - XMLGroup: Publish table as a document
 - XSLTransform: Extensible Style sheet Language Transformation (XSLT)
- **Check constraints on XML Column**
 - Enables management of XML values and columns by XML Schema(s)
 - Enforce XML column values validate with XSD(s)
 - Select validated documents by XSD(s)
- **Parameter passing to SQLQuery**
 - SQL can call XQuery and pass parameters
 - XQuery can call SQL but not parameters
 - Leads to writing convoluted and/or inefficient XQuery for very simple use cases

```
XQUERY
for $docid in (1,2,3),
    $j in db2-fn:sqlquery('select xmlcol from t1 where docid = parameter(1)',
                        $docid)/bib/book
where count($j/author) > 1
return $j;
```

Agile XML: SOA and Enterprise Application Integration

- **Remove restrictions to support EAI using DB2 XML capabilities**
 - EAI and SOA use XML as message formats

- **Trigger Support on XML columns**
 - Enable before trigger on new XML data for validation against schema
 - Removes the requirement for explicit validation with every insert statement

- **XML Replication**

- **Sub-document update**
 - Provide more support for structural modifications to XML documents
 - Replace section, append section, add description, etc.
 - Inside DB2 implementation – avoid parsing, serialization, client code
 - Implementation follows closely the draft specification for Xquery Update language support

Agile Development: Enabling Applications

- **Improved performance of LOB management**
 - Improve the performance when returning many rows containing LOB data (2x)
- **Database Roles**
 - Role membership is assigned to a user or group and role privileges are available for use in any and all activities under taken by the connection user.
 - The existence of roles will allow for SQL objects like views, packages, or triggers to be created by users who acquire the needed privileges through roles assigned to them.
- **Support Application which use VARRAY**
 - Provide support for an ARRAY data type for use within Procedures and applications
- **Global Variables**
 - Support for created session global variables
 - Value can be changed using SET, SELECT INTO, and VALUES INTO statement
- **Larger Identifier Support**
 - Increase all identifiers to 128 bytes except for:
 - Bufferpool, tablespace, index extension, ADT transform group, type mapping

Agile Development: Java Application Development Enablement

- **Description:**
 - Support application development and execution for the Java platform

- **Provide the ability to ...**
 - Update JDBC standard level
 - Improve on XML and SOA tooling support
 - Improve Java capabilities for all servers

- **Key technology components:**
 - JDBC 4 Compliance
 - Integrated Xquery builder and SOA web services tooling support
 - Integrate new unified Visual Explain

Agile Development: Non-Java Application Development Enablement

- **Description:**
 - Support application development and execution for the Microsoft and Open Source specific models

- **Provide the ability to ...**
 - Extend support for Open Source programming languages
 - Improve .NET capabilities for all servers

- **Key technology components:**
 - 64 bit .NET enablement and support for all servers
 - Support new server data types
 - Ruby on Rails support and PHP enhancements
 - Python server support
 - Integrated Xquery builder and support for SOA



DB2 Viper 2 Open Beta: Experience what's next

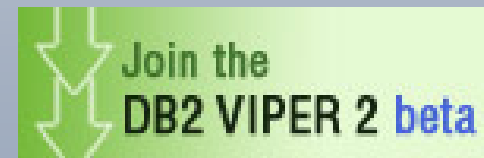
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DB2 VIPER 2 **beta**



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DB2 Viper 2 Open Beta

- ***DB2 Viper 2 Open Beta is now live!!***
 - Please join the beta and learn more about what's coming with DB2 Viper 2
 - Your feedback and participation will help us shape the future of DB2
 - **Main DB2 Viper 2 Open Beta Page:**
 - <http://www-306.ibm.com/software/data/db2/9/openbeta.html>
 - **DB2 Viper 2 Forum:**
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Thanks!!

For more information or questions contact:

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