



IBM Software Group | <http://ibm.com/db2/express>

# DB2 Express-C

Flexible, Leading Edge and Community friendly



**DB2** Information Management Software



@business on demand software

DB2 EXPRESS-C COMMUNITY TEAM

# Agenda

## DB2 Information Management Software

- **The new DB2 Express-C**
- DB2 Express in the market place
- Development and Deployment
- The Power of DB2

## DB2 Express: News

DB2 developer and user  
community development

### No charge DB2 Express-C now available

#### **New focus on partner and developer community development**

- High value, production, Linux or Windows data server
- No limits – on database size, number of users, instances per server
- A fast path to reliable relational and XML data management
- Free access to Web community forum and content
- Free to embed/redistribute with third party applications and products
- No application charge when upgrading to other DB2 editions
- Full product images for every FixPack

# What is DB2 Express-C?

*brings innovative technology, proven reliability and deployment flexibility to partner and developer community*

- Linux and Windows, 32 and 64-bit platforms
- 1-2 CPU Server
- 4GB Memory

- No Database Size Limit
- No Limit on Number of Users or Connections
- No Limit on Number of Instances Per Server

#### **Excludes:**

- Warehouse Manager Tools & Servers, Extender support, DB2 Connect support, Informix data source replication, Replication Data Capture, web based tools, APPC and Netbios

# DB2 Express: Understanding the differences

DB2 Express Edition	DB2 Express-C
Aligned to mid-market needs	Aligned to mid-market needs and developers, partners, academic communities considering or using open source databases
Per processor or Per server/users licenses orderable in Passport Advantage	Free download available late January 2006
12mo 24x7 support	Free Web community forum and content
HADR feature available	HADR feature purchase requires DB2 Express Edition purchase
Download footprint 390MB	Download footprint <300 MB
<p>Features <b>include</b>:</p> <p>Warehouse Manager tools &amp; servers, Extender support, DB2 Connect support, Informix Data Source Replication, Replication Data Capture, Web based tools, APPC and Netbios</p>	<p>Features <b>exclude</b>:</p> <p>Warehouse Manager tools &amp; servers, Extender support, DB2 Connect support, Informix Data Source Replication, Replication Data Capture, Web based tools, APPC and Netbios</p>

# Designed for simplicity, efficiency and ease of use in small and medium database deployments

Key attributes of the patented IBM Express Architecture	
<p><b>Easy to Evaluate, Purchase and Support</b></p> <ul style="list-style-type: none"> <li>▪ High quality evaluation and implementation support materials</li> <li>▪ Web-based support</li> <li>▪ Resources help ensure adequate skills</li> </ul>	<p><b>Complete Integrated Solution</b></p> <ul style="list-style-type: none"> <li>▪ Only required features provided</li> </ul>
<p><b>Easy to Install</b></p> <ul style="list-style-type: none"> <li>▪ Single-server installation takes minutes, not hours</li> <li>▪ Guided, non-disruptive installation and setup</li> <li>▪ OEM-ready with silent install/uninstall</li> </ul>	<p><b>Competitive Features</b></p> <ul style="list-style-type: none"> <li>▪ Secure by default</li> <li>▪ Well-documented features</li> <li>▪ Consistent function</li> <li>▪ Quick and easy problem determination</li> </ul>
<p><b>Easy to Learn and Use</b></p> <ul style="list-style-type: none"> <li>▪ Simple, intuitive user interface</li> <li>▪ Samples and tools facilitate quick, successful first-use</li> <li>▪ Accessible, useful documentation</li> </ul>	<p><b>Right Technology</b></p> <ul style="list-style-type: none"> <li>▪ Proven technology to ensure reliable operations and minimize downtime</li> </ul>
<p><b>Easy to Integrate</b></p> <ul style="list-style-type: none"> <li>▪ Coexists and works well with other Express products</li> <li>▪ Supports important mid-market components and applications</li> <li>▪ Exploits key platform services that reduce total cost of ownership (TCO)</li> </ul>	<p><b>Extensible and Flexible</b></p> <ul style="list-style-type: none"> <li>▪ Available on all key mid-market platforms with priority for Win2000, iSeries and Linux</li> <li>▪ Modular, easy to customize and extend</li> </ul>
<p><b>Demonstrates Good ROI</b></p> <ul style="list-style-type: none"> <li>▪ Resource usage that is competitive</li> </ul>	<p><b>Priced to Market</b></p> <ul style="list-style-type: none"> <li>▪ Price linked to usage, based on number of users or processors</li> <li>▪ TCO attractive to SMBs</li> </ul>
<p><b>Easy to Manage</b></p> <ul style="list-style-type: none"> <li>▪ Self-configuring for reduced administrative skill and interaction needs</li> <li>▪ Supported by reasonable defaults, application templates and wizards</li> <li>▪ Routine tasks are automated and self-optimizing</li> </ul>	

# DB2 Express-C is for EVERYBODY

## Developers

- ▶ Choose the Development Environment and IDE that best meet your needs: J2EE, Windows .NET, PHP, Python and more
- ▶ Evan Data Corp 2005 Developer Choice's Award winner for the Best Database tools category
- ▶ XML / SOA / Web Services capabilities due in v10 are second to none

## ISV & Business Partners

- ▶ Increase your product value without incurring up front costs
- ▶ Improve competitiveness by embedding a market proven database without raising the price tag
- ▶ Open new door by reselling optional commercial license with IBM support

## Mid-Market Solution Providers

- ▶ IBM extends your reach to fast growth SMB market
- ▶ Partnership – IBM's PWIN program is second to none
- ▶ Investment Protection – seamless upgrade to other DB2 editions

## Academic Community

- ▶ Download and start development at no charge
- ▶ Easy to use, easy to learn, easy to administer database
- ▶ Education courses material available via IBM Academic Initiative

# Zend Core for IBM w/No Charge DB2 Express by Year End

10/19/05 PHP Conference - Rod Smith Keynote



- **Business Partnership Brings 1<sup>st</sup> “Web Stack” to Market**
  - ▶ Enables and eases the development and deployment of dynamic, database-driven PHP applications
- **Zend Core for IBM**
  - ▶ Simplified deployment package of PHP environment
  - ▶ Integrated with Derby/Cloudscape and DB2 UDB
- **Zend Core for IBM - to include no-charge DB2 Express for PHP application deployment!**
  - ▶ Update will be delivered before end of 2005
  - ▶ Optional commercial license will be available from IBM



*Thousands of Downloads Since July Availability*



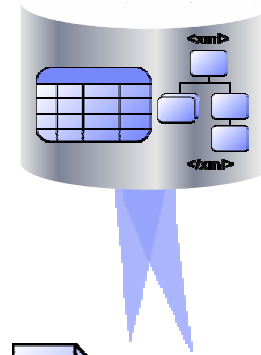
# DB2 Express-C Will Include Viper Technologies

*IBM Moves the Database Goalposts...*

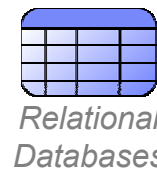
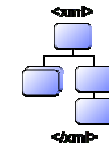
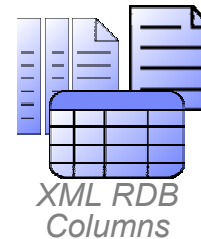


- **Deep XML integration simplifies & unifies the infrastructure**
  - Unifies Data and Content
  - Extends Asset Utilization
  - Leverages Existing Skills
  
- **Native XML document storage in DB2**
  - Ensures fidelity of XML document
  - Optimizes Performance
  - Provides Flexibility
  - Leverages Mature DB2 Services
  
- **XML is changing the game**
  - Technology Preview today

*Hybrid Capabilities  
Flexible Infrastructure*



- XQuery and/or SQL
- XML and/or Relational Data



*Content  
Repositories*



*Digitized  
Content*

*Files*

# Agenda

## DB2 Information Management Software

- The new DB2 Express-C
- **DB2 Express in the market place**
- Development and Deployment
- The Power of DB2
- Support options

# The DB2 Information Server Family

The leading information server optimized to leverage z/OS qualities of service in a mainframe environment

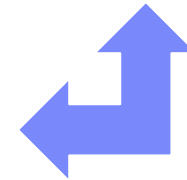
*DB2 for z/OS*

*DB2 Universal Database Enterprise Server Edition*

Provides reliability, scalability and high performance for enterprise-wide transaction processing, web-based solution or high end data warehouses with tens of terabytes of data

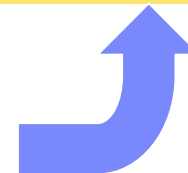
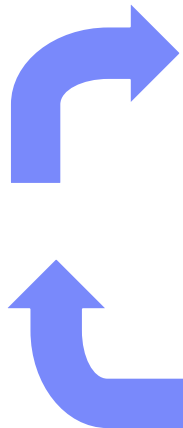
Serves multiple transactional and analytic applications in a departmental or workgroup environment

*DB2 Universal Database Workgroup Edition*



*DB2 Universal Database Express Edition and DB2 Express-C*

A readily accessible enterprise-ready full functional database designed for mid-market--**download, develop, deploy, redistribute and embed** at no license fee



# DB2 for Linux, UNIX and Windows

The power, function and reliability of an open, industry standard database with the ability to scale from small and medium businesses to large enterprises.

**Performance** - Leading performance and industry benchmarks

**Scalability** - Online processing & business intelligence scaling to 1000+ nodes

**TCO** - Proven lower than the competition by both customers and analysts

## Express Edition

- Linux and Windows, 32 and 64-bit platforms
- 1-2 CPU Server
- 4GB Memory

## Workgroup Edition

- Linux, UNIX, and Windows, 32 and 64-bit platforms
- 1-4 CPU Server
- 16GB Memory

## Enterprise Edition

- Linux, UNIX, and Windows, 32 and 64-bit platforms
- No limits
- Partitioning feature

# Choosing between DB2 Express-C and Cloudscape

## If your client:

- Requires a low cost data server
- Needs .NET, Java, and PHP support
- Considers an open source data server
- Requires XML and SOA support

## Questions to ask:

▪ Do you require a low-cost, high value data server for production use and/or free redistribution?	Yes	Yes
▪ Do you require an complete invisible, small foot print data server to embed in your application?	No	Yes
▪ Do you require “write-once, deploy-anywhere?”	No	Yes
▪ Do you require both XML and relational data serving?	Yes	No
▪ Do you require a high performance and scalable data server?	Yes	No

**DB2 Express-C**

**Cloudscape**

# DB2 V8.2 Family Comparisons

	DB2 Express-C	DB2 Express	Workgroup	Enterprise
<b>Target Audience</b>	Mid-market and developers, partners, academic communities considering or using open source databases	Mid-market and the partners who serve them	Workgroup and Departmental organizations and the partners who serve them	Large enterprises building or buying high volume OLTP, web or analytics solutions and the partners who serve them
<b>Objective</b>	Seed the market, create opportunities for other IBM products, increase DB2 footprint	Drive revenue growth in mid-market segment	Drive revenue growth in high-end SMB and department segment	Drive rev growth in large enterprise segment
<b>Platforms</b>	Linux, Windows	Linux, Windows	All	All
<b>Download</b>	250-300 MB	390 MB	Larger	Larger
<b>Memory limit</b>	4GB	4GB	16GB	Unlimited
<b>32/64 bit</b>	32/64 bit	32/64 bit	32/64 bit	32/64 bit
<b>CPU limit</b>	2	2	4	Unlimited
<b>DB Size</b>	Unlimited	Unlimited	Unlimited	Unlimited
<b>Add-On features</b>	None	High Availability / Disaster Recovery	High Availability / Disaster Recovery, Query Patroller	Data Partitioning, Query Patroller, Geodetic Extender
<b>SRP</b>	No charge	\$4874/CPU or \$625 /server+\$124/user	\$1211/server + \$311/user or \$9375/processor	\$33125/processor or \$750/user
<b>Support</b>	Web community support	Passport 24X7	Passport 24X7	Passport 24X7

# DB2 Express VS other databases

	DB2 Express-C	MySQL Pro	Oracle XE	SQL Server Express
<b>Platforms</b>	Linux, Windows	Linux, Windows and selected UNIX	Linux, Windows	Windows only
<b>Download</b>	390MB	35MB (no tools)	150-190MB	64MB (no tools)
<b>Memory limit</b>	<b>4GB</b>	None	1GB	1GB
<b>32/64 bit</b>	<b>32/64 bit</b>	32	32	32
<b>CPU limit</b>	<b>2 CPU dual core</b>	None	1	1
<b>DB size limit</b>	<b>None</b>	None	4GB	4GB
<b>APIs</b>	C, JDBC, .NET, XML, PHP, Python, etc	C, JDBC, .NET, PHP, Python	C, JDBC, .NET, PHP, XML	.NET
<b>Development Tools</b>	Eclipse, VS .Net, Toad, DB2 DC, ...	None	HTML DB	VS .NET
<b>Management</b>	<b>Extensive DB2 Suite (Control Center, Information Center, dozens of wizards, autonomic tools, ...)</b>	NONE (tools can be found in online repositories but no INTEGRATION provided by mySQL)	Custom Web Based Tools	SQL Express Manager
<b>Replication</b>	Yes	Yes	Yes	Yes
<b>Free Production / Redistribution</b>	<b>YES / YES</b>	NO / NO (commercial grade version)	YES / YES	YES / YES
<b>License Fee</b>	<b>None</b>	None for OSS (but mandatory for commercial grade version)	None	None
<b>Support</b>	Forum and fee-based	Forum and fee-based	Forum only	Only with upgrade

## DB2 Express-C versus DB2 Express

- No change in code for core function (additional features in DB2 Express available)
- No change or upgrade needed for move from Express-C license to full warranted DB2 Express license
  - ▶ Simple purchase proof and customer number sufficient
  - ▶ Upgrade and FixPack application possible
- Simple access to support contracts through VADs and VARs
  - ▶ Support can be bundled from ISVs, platform vendors
  - ▶ No complex contract negotiations – many vendors sell directly with credit card over the net



## DB2 Express-C Redistribution

- Register with the Express Community Team for redistribution
  - ▶ Legal requirement
  - ▶ Simple form to fill out – response through “welcome” email as permission to redistribute DB2 Express-C
  - ▶ Contact [db2x@ca.ibm.com](mailto:db2x@ca.ibm.com) for details or download form from the web
  
- Any subset of default package for redistribution But...
  - ▶ Document if you repackage
  - ▶ Document what you repackage
  - ▶ Document how to get upgraded to the full kit

# DB2 Express Forum

- REGISTER to ENGAGE !
  - ▶ Submit questions, answers, best practices, opinions,....
  - ▶ Whitepaper (outside of IBM) encouraged
  
- Core staffing with SMEs form the DB2 community team
  - ▶ Answering whatever comes up
  - ▶ Coordinates community needs
  - ▶ Operates the community meetings, chats and online round tables

# DB2 Express-C Community Team

- They are
  - ▶ ... the experts for using DB2 Express-C
  - ▶ ... your partner in helping other people
  - ▶ ... contact for open source projects, ISVs, developers
  
- They are not
  - ▶ ... your way to get PMR opened without support contact
  - ▶ ... your unlimited development assistance
  - ▶ ... your anything I ever wanted IBM to ask
  
- They need a cool name !
  - ▶ Express'perts ?
  - ▶ Expressionists ?
  - ▶ Expressos ?

# Agenda

## DB2 Information Management Software

- The new DB2 Express-C
- DB2 Express in the market place
- **Development and Deployment**
- The Power of DB2

## DB2 for Linux: ease of installation

- DB2 Version 8 on Linux offers multiple installation methods:
  - ▶ Best for humans: Graphical interface offers a five-click simple install or detailed customized install
  - ▶ Best for machines: Response file install offers automated, customized install
- DB2 for Linux validation program:
  - ▶ Intensive test suite validates combination of DB2 for Linux with distributions, hardware, and other software
  - ▶ Offers detailed installation requirements by distribution
  - ▶ Sample of current validated Linux distributions:
    - SLES 8 / 9
    - RHEL 3 / 4
    - Asianux 1.0, Red Flag 4.1, Mandriva 3.0, Ubuntu 5.04
  - ▶ More details on <http://ibm.com/db2/linux/validate>

## Embedding DB2: Silent Install (Linux)

- DB2 enables silent installs through response files, which specify:
  - ▶ Features & components to include
  - ▶ Registry variable and configuration parameter settings
  - ▶ Instance names (automatically creating users and groups)
  - ▶ Database names
  - ▶ Automatic maintenance
- You can generate a response file by:
  - ▶ Walking through the DB2 install GUI, saving the install choices in a response file, and editing the response file:
    1. Change LIC\_AGREEMENT from DECLINE to ACCEPT
    2. Set username and password
  - ▶ Editing the sample response files packaged on the DB2 CD-ROMs in `db2/platform/samples/*.rsp` directory
- To install DB2 using a response file:

```
setup -u <response file>
```

## Embedding DB2: Silent Install (Windows)

- DB2 for Windows supports the same methods for creating response files as Linux
- Response File Generator offers the ability to clone an existing database:
  1. Install and set up DB2, instances, and databases using your preferred method.
  2. Configure your DB2 system as much as you like.
  3. Run the response file generator (db2rspgn) to reverse-engineer your DB2 system.

```
db2rspgn -d <output directory>
```

- To install DB2 using a response file:

```
setup -u <response file>
```

## Trimming an embedded version of DB2 (Linux)

- Pre-install FULL FUNCION and TOOLS INCLUDED footprint of DB2 for Linux is approximately 480 MB
- You can reduce this footprint significantly by removing files and RPM packages associated with functionality that may be unnecessary for your application, such as:
  - ▶ Graphical installer
  - ▶ IBM SDK for Java
  - ▶ National language support
  - ▶ Graphical tools
- Additional selected smaller packages and packages for different installers will be available for Express



## Trimming an embedded version of DB2 (Windows)

- `db2iprune` utility (located in the `\db2\windows\utilities\db2iprune\` directory of your install image) enables you to remove unnecessary functionality (and size!) from your DB2 install image
  1. Edit the \*.prn file to remove the components your install does not need
  2. Run `db2iprune` against the edited \*.prn file to create a new install image:

```
db2iprune -r <prn_file> -p <source> -o <output>
```
- ▶ For example:

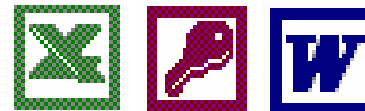
```
db2iprune -r c:\embed\db2ese.prn -p C:\images\ese -o C:\images\ese_new
```

# Resources

- Mass deployment of DB2 Universal Database Version 8.2 on Microsoft Windows operating systems: IBM white paper  
<ftp://ftp.software.ibm.com/software/data/pubs/papers/db2massdeployment.pdf>
- Response file installation basics: DB2 Information Center  
<http://publib.boulder.ibm.com/infocenter/db2help/topic/com.ibm.db2.udb.doc/start/c0007503.htm>
- Client merge modules topic: DB2 Information Center  
<http://publib.boulder.ibm.com/infocenter/db2help/topic/com.ibm.db2.udb.doc/start/r0011696.htm>

# Application Development Freedom

- C/C++ (ODBC and Static SQL)
- JDBC and SQLJ
- Borland
- PHP
- Perl
- .Net languages
- OLE-DB
- ADO
- Web Services
- SQL
- MS Office: Excel, Access, Word



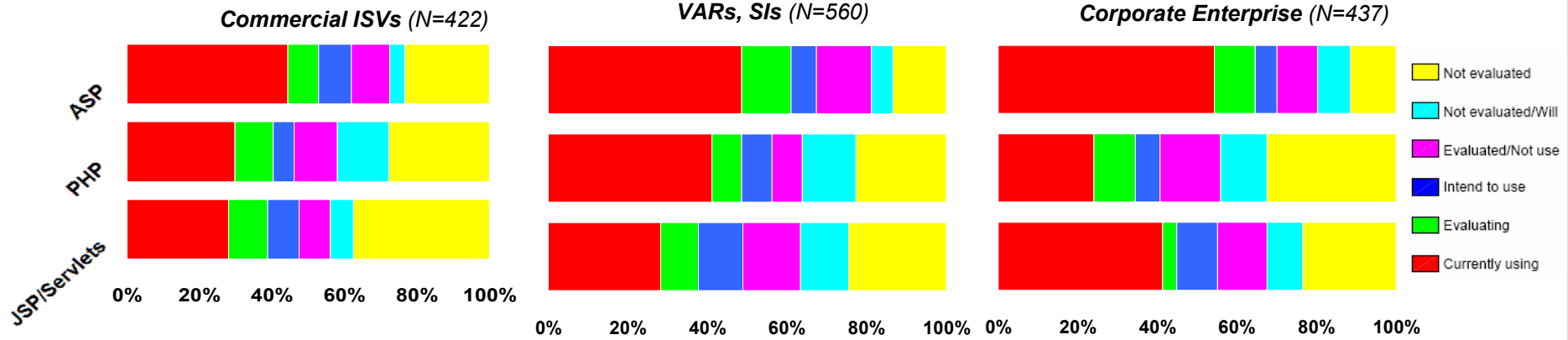
IBM® DB2 Universal Database™  
SQL Reference

for Cross-Platform Development

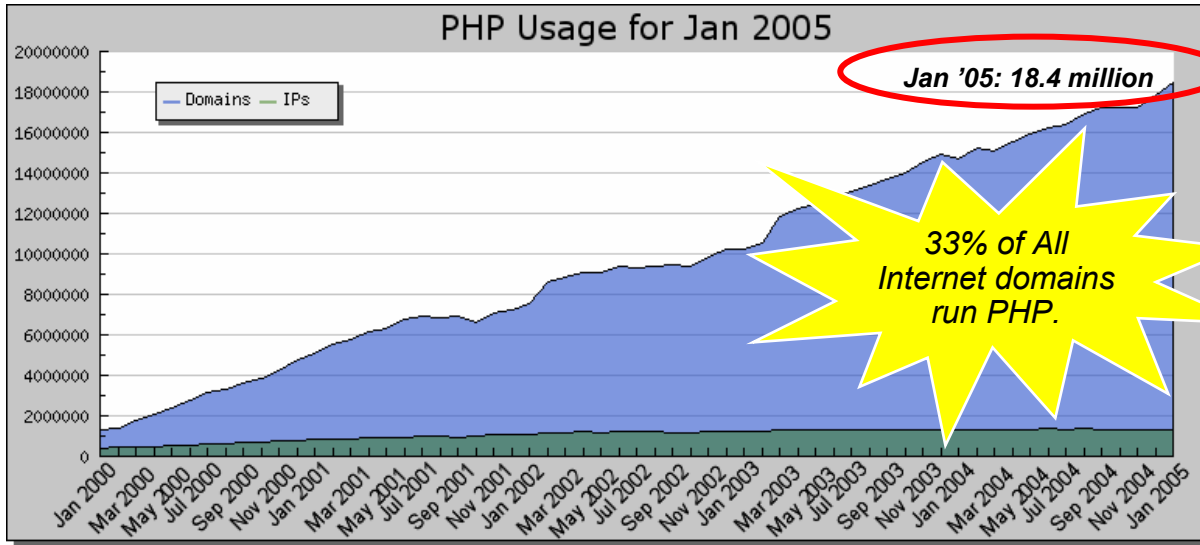
<http://www7b.software.ibm.com/dmdd/library/techarticle/0206sqlref/0206sqlref.html>

# Scripting Language Usage

Compared to JSP/Servlets, PHP has achieved a higher level of usage with ISVs, VARs and SIs even without the backing of an enterprise software vendor such as IBM, Oracle, Sun or Microsoft.



Source: Evans Developer Study: Fall 2004 (North American Developers)

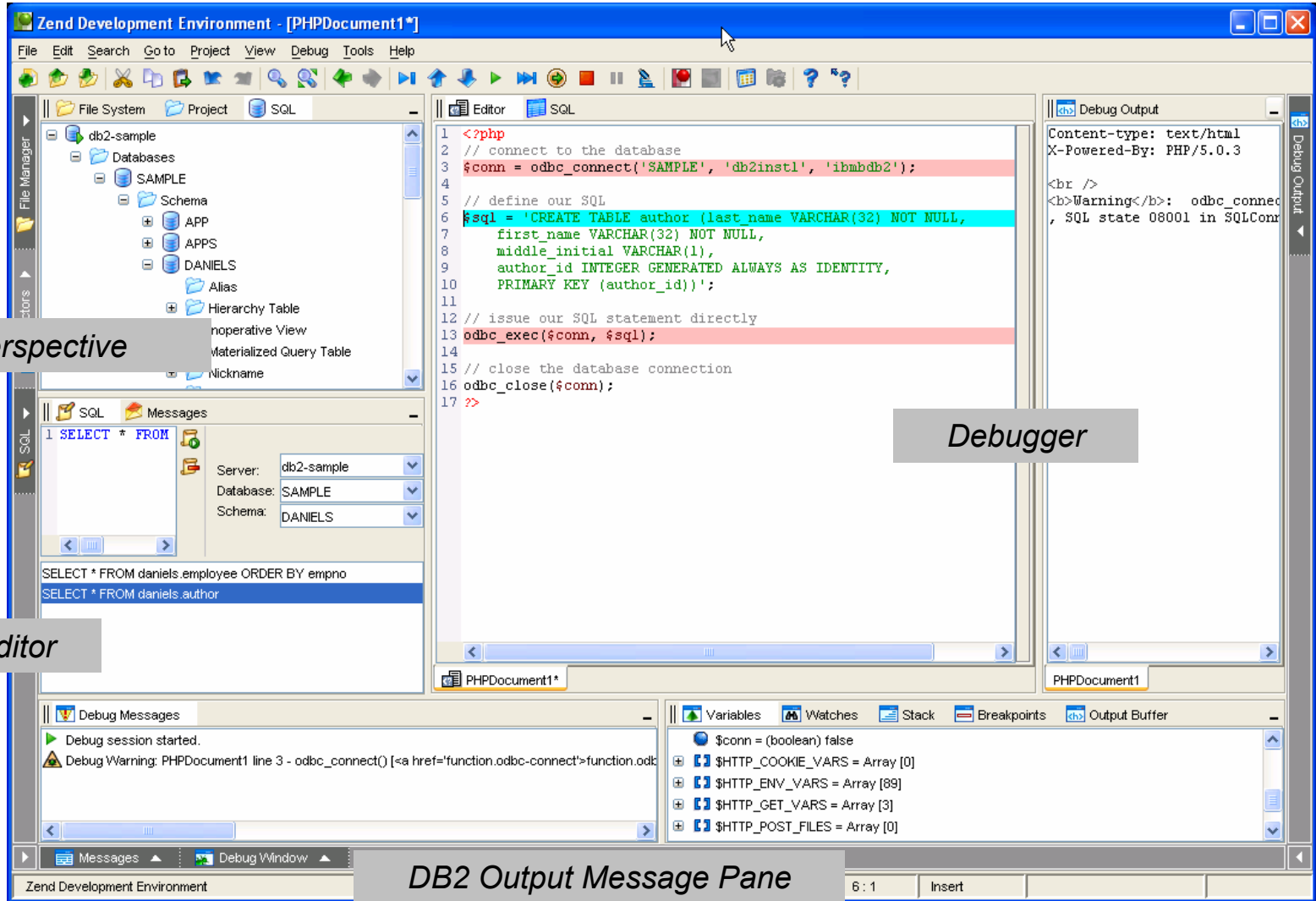


## Scripting Technologies used with Apache

Jan. 2005

- PHP 6.9 million
- perl 1.5 million
- python 0.2 million

# DB2 UDB Integration into Zend Studio for PHP



*Data Perspective*

*Debugger*

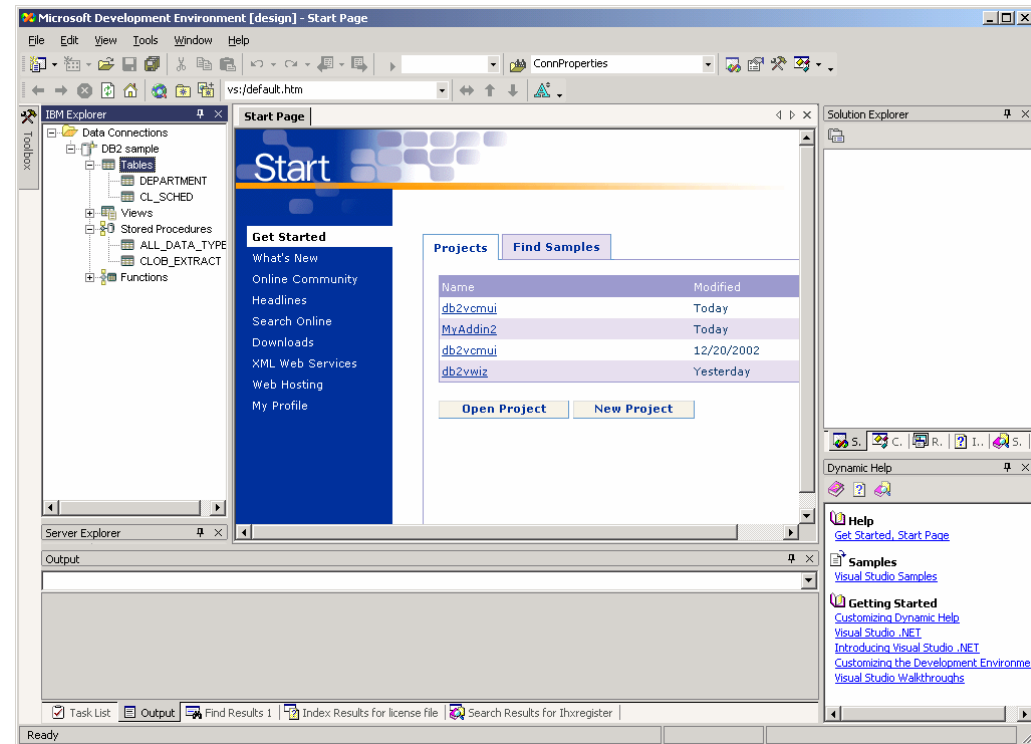
*SQL Editor*

*DB2 Output Message Pane*

# Microsoft .NET Programmers



- Deep integration in to VS.NET 2003 and 2005
  - ▶ DB2 delivered since 2003
- Drivers:
  - ▶ DB2 .NET Data Provider
  - ▶ DB2 Everyplace .NET Data Provider supports .NET Compact Framework
  - ▶ IDS .NET Data Provider
- CLR Stored Procedures:



## A Final Thought on Developing Applications

- No matter which programming language they use, your application developers can remain blissfully ignorant about the database server and focus on their code
- DB2 Express uses **exactly** the same code base as a 64-node DB2 Enterprise Server Edition
  - ▶ Same APIs
  - ▶ Same SQL
  - ▶ Same deployment
- So the same application can access hundreds of gigabytes of data by connecting to DB2 Express, or hundreds of terabytes of data by connecting to DB2 Enterprise Server Edition, by changing a single connection string

# Agenda

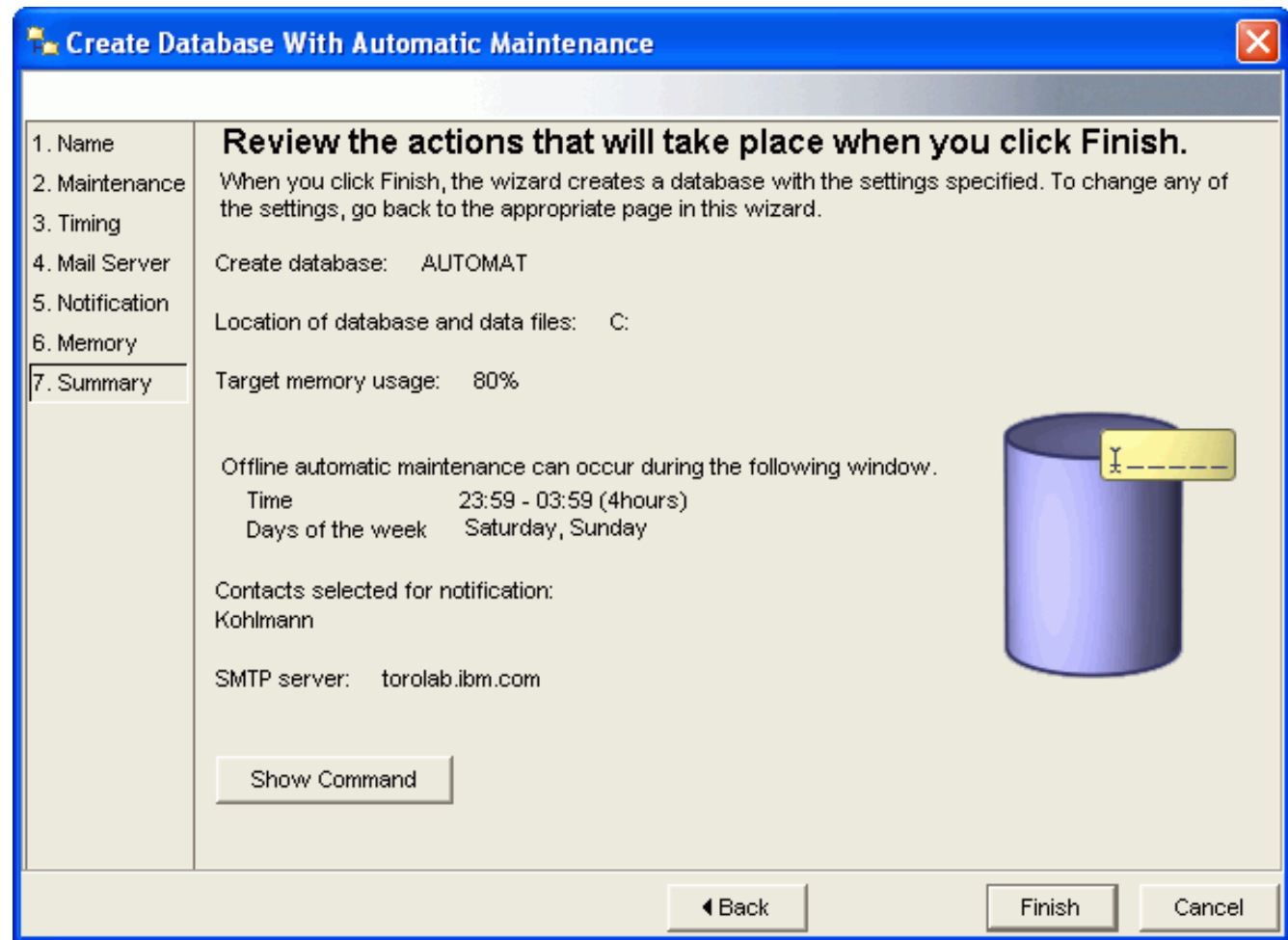
## DB2 Information Management Software

- The new DB2 Express-C
- DB2 Express in the market place
- Development and Deployment
- **The Power of DB2**



# Create Your Own Production Ready Database

- Creates a new database on the disk or directory of your choice
- Assigns disk space for your data
- Configures the new database for performance
- Turns on automatic maintenance
- Configures notification by e-mail or pager if the database needs attention



# Autonomic Manageability

## Less Skill, Less Resource, Better System Utilization

### DB2 UDB Express

- **Provide Automated Expert Advice**

- ▶ Configuration and Design Advisor
- ▶ Health Monitor

- **“Built-in” Automation**

- ▶ On-demand Storage
- ▶ Automated Maintenance
- ▶ Optimization, Parallelism and More

- **Setup and Configuration**

- ▶ Configuration Assistant
- ▶ Numerous Wizards



## Health Monitoring

- **Why?**
  - ▶ how do you know if DB2 is running okay, performing well?
  - ▶ what if you manage to figure out it's "unhealthy", then what?
  - ▶ can be difficult to determine what to monitor and when to monitor
  - ▶ need to set up monitors, notification, & resolution mechanisms
- **Management-by-exception model:**
  - ▶ DB2 monitors its own health right out of the box
  - ▶ notifies upon encountering unhealthy conditions: e-mail, page, logs
  - ▶ advises on severity of condition, and suggests resolutions
  - ▶ initiates corrective action if required, requested
  - ▶ Recommend Advisor – guides user on how to fix problems
- **An Up-and-Running Dream!!**
  - ▶ install DB2, provide an e-mail or pager address, "db2start"



# Health Monitor: interfaces

Data Element	Value	Category
ARTISAN.SALES		
Alarm		
Database-wide Shared Sort Memory Utilization	95	Sorting

Alert Type	Health Indicator	Value	Category	Object Name	Partition	Object Type	Time Stamp
Alarm	<a href="#">Database wide shared sort memory utilisation</a>	89%	Memory	Matrix.Artisan	0	Database	7/17/2001 08:00
Alarm	<a href="#">Container One is running out of space.</a>	96%	File	Matrix.Artisan	0	Database	7/17/2001 08:00
Warning	<a href="#">Container Three is running out of space.</a>	92%	File	Matrix.Artisan	0	Database	7/17/2001 08:00

```
(horman@healthy) /home/horman $ db2 get health snapshot for DBM

Database Manager Health Snapshot

Node type                = Database Server with local clients
Instance name            = horman
Snapshot timestamp       = 03-27-2002 13:24:51.799180

Database Manager Health Indicators:

Health Indicator ID      = 2 (db2.sort_privmem_util)
Value                    = 86
Evaluation timestamp     = 03-27-2002 13:20:07.910561
Alert state              = warning
```

# Configuration Advisor

- Recommends database configuration based on environment and type of database.
- Can be embedded as part of the installation

**Configuration Advisor**

**Review the performance configuration recommendations.**


Based on your selections in this advisor, as well as the volume of data in the database, and system information, this advisor recommends the following values.

Parameter	Current value	Suggested value	DB2 Parameter
Package cache	650	<b>859</b>	pckcachesz
Recovery range and Soft checkpoint inte...	120	120	softmax
Sort heap size	500	<b>739</b>	sortheap
Statement heap size	2048	2048	strmheap
<b>Utility heap size</b>	<b>5000</b>	<b>39937</b>	<b>util_heap_sz</b>
Number of FCM buffers	1024	1024	fcm_num_buffers
Enable intra-partition parallelism	0	0	intra_parallel
Maximum query degree of parallelism	-1	<b>1</b>	max_querydegree
Maximum number of agents	200	200	maxagents
Agent pool size	-1	<b>200</b>	num_poolagents
Initial number of agents in pool	0	0	num_initagents
Private memory threshold in 4KB pages	20000	<b>32767</b>	priv_mem_thresh
Sort heap threshold	10000	<b>14781</b>	sheapthres
IBMDEFAULTBP - Buffer pool size	3891	<b>119813</b>	IBMDEFAULTBP

Navigation buttons: Back, Finish, Cancel

# Configuration Advisor: automatic environment detection

- System Information
  - number of physical disks
  - physical memory size (RAM)
  - CPU information
    - number of online CPU
    - number of configured CPU
  - OS features
    - OS type and release (OS2, Windows, NT, Unix etc)
- Database Information
  - size of database
  - number of tables
  - number of indexes
  - number of tablespaces
- Bufferpool Information
  - name, size for each bufferpool
  - number of bufferpools



**Self-  
managing  
software  
senses  
its own  
execution  
environment**

## 'On Demand' Storage

- Single point of storage
  - ▶ Databases can define automatic storage parameters that the tablespaces will inherit
    - Ability to specify initial size and growth size

```
CREATE DATABASE TOR
    AUTOMATIC STORAGE YES ON
    /db2/TOR/storagepath001,
    /db2/TOR/storagepath002,
    /db2/TOR/storagepath003
    AUTORESIZE YES
    INITIALSIZE 5 G
    INCREASESIZE 100 M
    MAXSIZE NONE
```

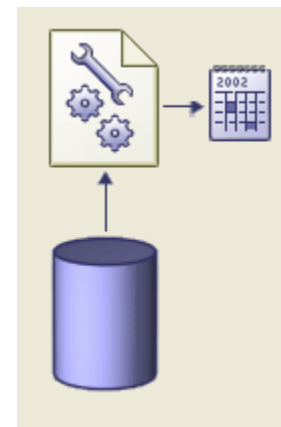
- ▶ Auto grow existing tablespaces

```
ALTER TABLESPACE TORBTABD
    AUTORESIZE YES INCREASESIZE 50 M
```

# Automatic Maintenance

- Define periods of low or no activity for the database
- Choose maintenance activities for DB2 to handle automatically
- Choose people to be notified if automatic maintenance is unsuccessful
- DB2 will determine if maintenance is required
- If it is necessary it will be performed in the next available maintenance window

Database: KOHLMANN - DB2 - SAMPLE  
Maintenance: Fully automated





# Automatic Maintenance Advanced Settings

- Specify backup priorities
- Define backup location
- Online or offline
- Specify tables for Runstats and Reorg

[Configure Settings...](#)

- Optimize for database recoverability (more frequent backups)
- Balance database recoverability with performance
- Optimize for database performance (less frequent backups)
- Customize

#### Criteria details

Maximum time between backups 1 Week  
Maximum log space used between backups 15 MB

Selected tables

Use the simple filter

Conditions

Attribute	Comparison	Values
SCHEMA	Like	KOHLMANN
<Select>	Like	
<Select>	Like	

Clear

Meet all conditions  
 Meet any conditions

Resulting tables (SCHEMA.NAME)

- KOHLMANN.ADVISE\_INDEX
- KOHLMANN.ADVISE\_INSTANCE
- KOHLMANN.ADVISE\_MQT
- KOHLMANN.ADVISE\_PARTITION
- KOHLMANN.ADVISE\_TABLE
- KOHLMANN.ADVISE\_WORKLOAD
- KOHLMANN.CL\_SCHED
- KOHLMANN.DEPARTMENT

Refresh Resulting Tables >>

# Comprehensive Diagnostics with db2pd Service Tool

## Administrative Enhancements – db2pd

```
> db2 +c insert into H
DB20000I The SQL comm
```

```
> db2pd -locks -db samp
Database Partition 0 --
Locks:
```

Address	TranHdl	Loc
0x086A2AE8	2	535
0x086A28E0	2	020
0x086A2CF0	2	020

```
> db2 commit
DB20000I The SQL comm
```

```
> db2pd -locks -db samp
Database Partition 0 --
Locks:
```

Address	TranHdl	Loc
---------	---------	-----

### Collects information about:

- ▶ locks
- ▶ bufferpools
- ▶ tablespaces
- ▶ containers
- ▶ dynamic SQL statements
- ▶ agents
- ▶ applications
- ▶ memory pools and sets
- ▶ transactions
- ▶ logs
- ▶ and others

hldCnt	Att	Rlse
0	0	0x0
0	0	0x0
0	8	0x0

hldCnt	Att	Rlse
--------	-----	------

1 command gathers all diagnostics necessary to quickly pinpoint root cause

## Call to Action

### DB2 Information Management Software

- TELL EVERYBODY ! CUSTOMERS ! PARTNER ! ISVS !
- Download and Install DB2 Express TODAY!
- Tell your colleagues and co-developers about DB2 Express !
- Check out the <http://ibm.com/db2/express> website and read one or two of the great whitepapers about DB2 Express !
- Further questions ???? [db2x@ca.ibm.com](mailto:db2x@ca.ibm.com)

## Contacts for usual suspects

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# DB2 Express-C

Flexible, Leading Edge and Community friendly



**DB2** Information Management Software



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DB2 EXPRESS-C COMMUNITY TEAM