



# LAB: Toolbox for Java<sup>TM</sup>

*IBM @server iSeries 400 and AS/400e*

**Susan Funk**

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# *Lab: AS/400 Toolbox for Java*

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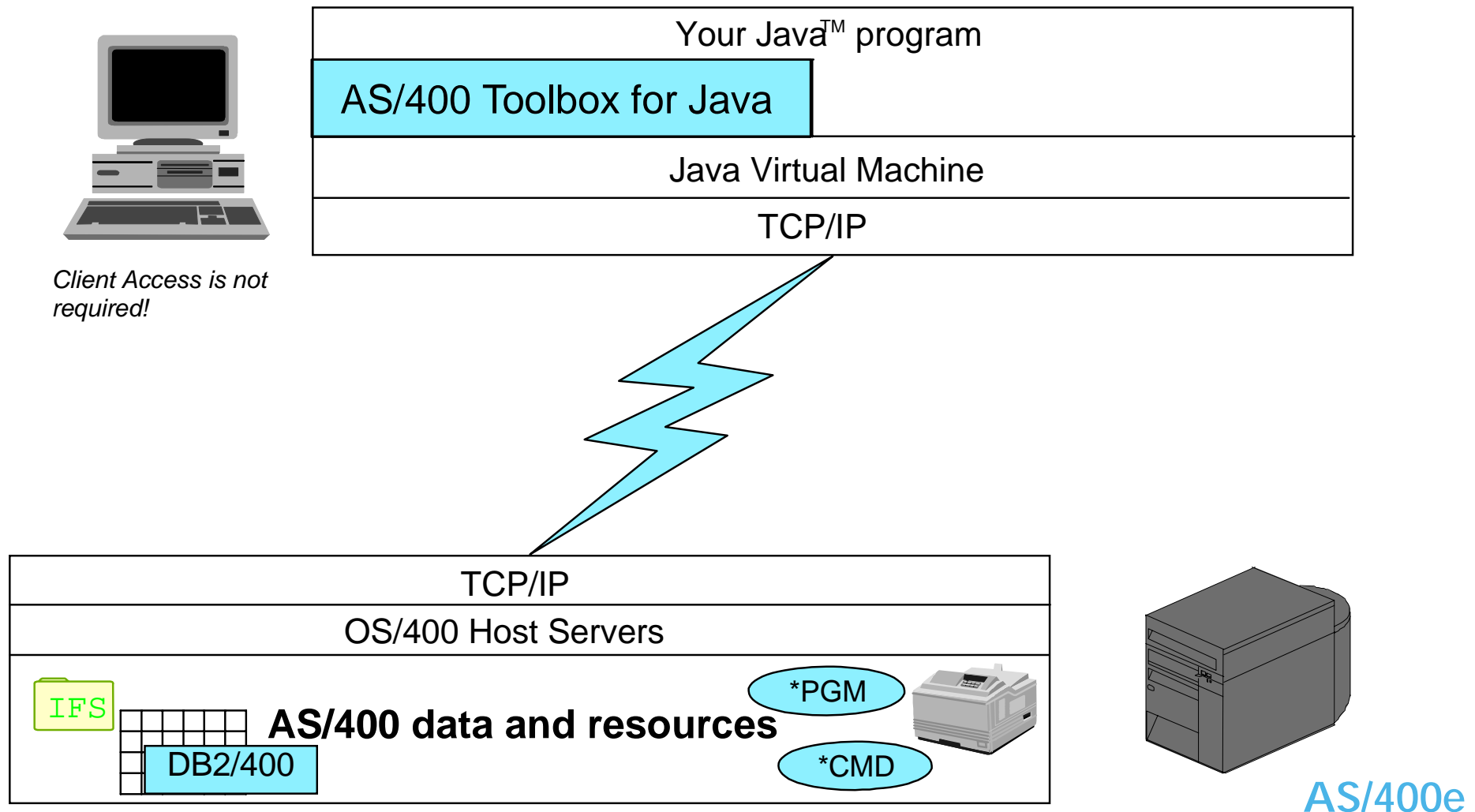
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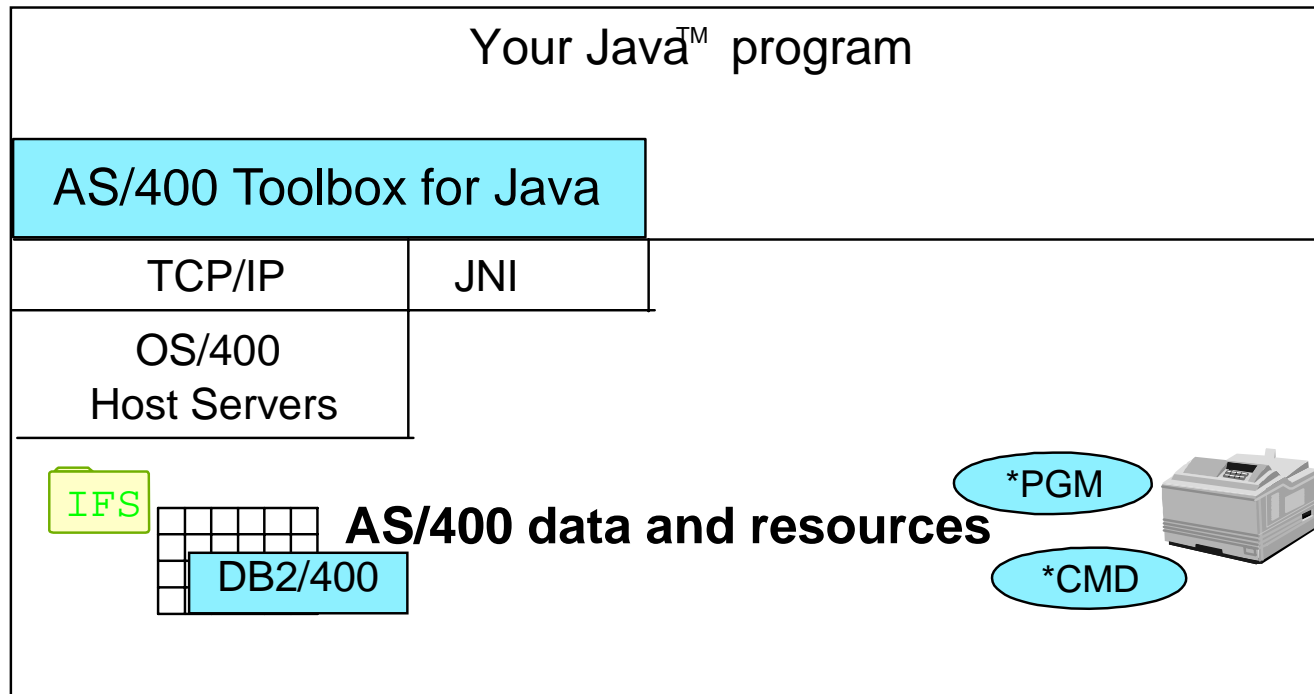
# AS/400 Toolbox for Java

## The big picture - Client/Server



# AS/400 Toolbox for Java

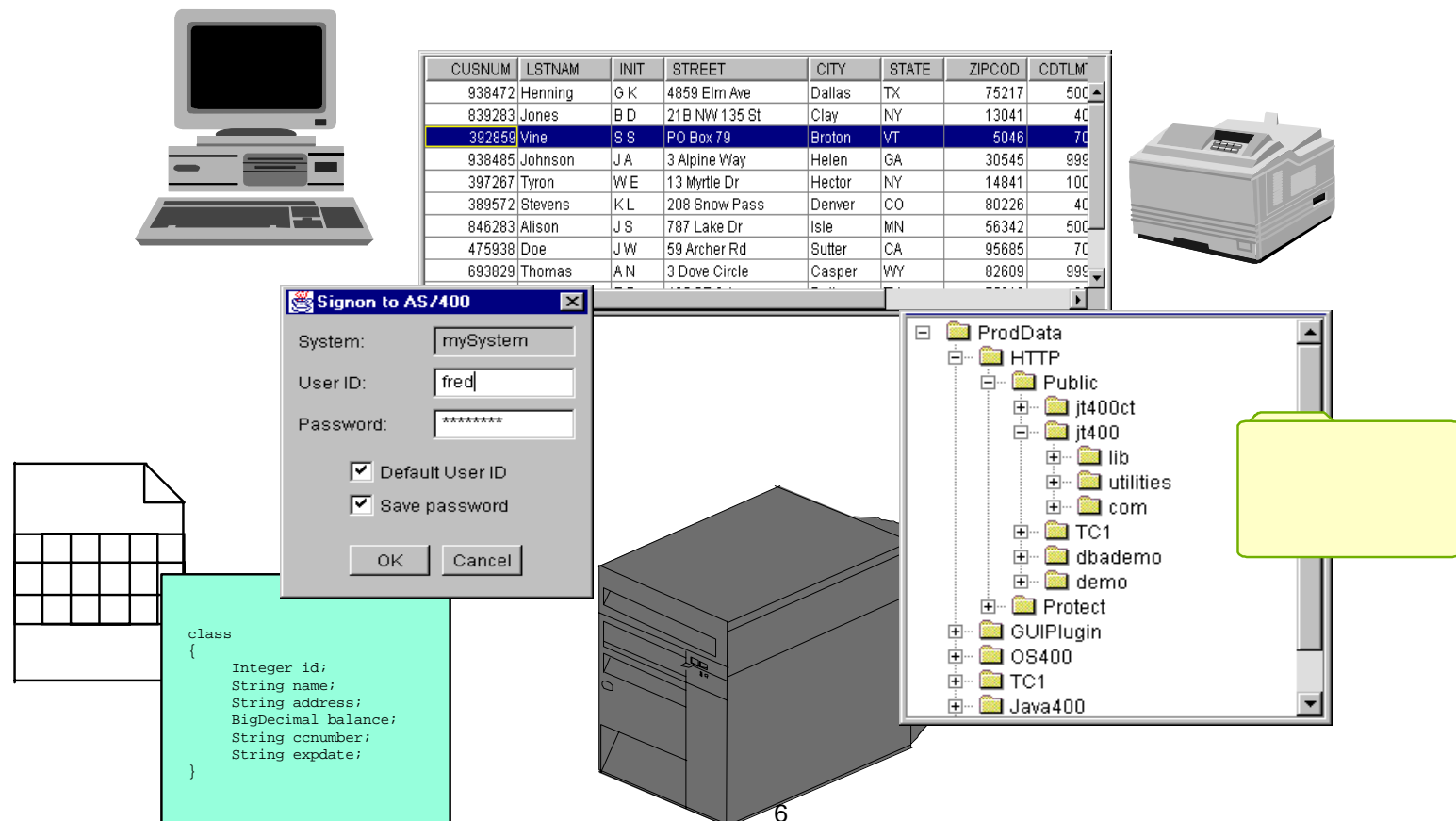
## The big picture - Toolbox and data on same AS/400



# AS/400 Toolbox for Java

## What is the Toolbox?

A set of Java classes and utilities which provide access to AS/400 data and resources



# *AS/400 Toolbox for Java*

## ***The details***



### **Certified 100% Pure Java**

- Supported platforms: AS/400, Linux, Windows, AIX, Solaris, OS/2, Netscape Communicator, Microsoft Internet Explorer

### **Requires Java 1.1.6 or greater and now supports Java 2**

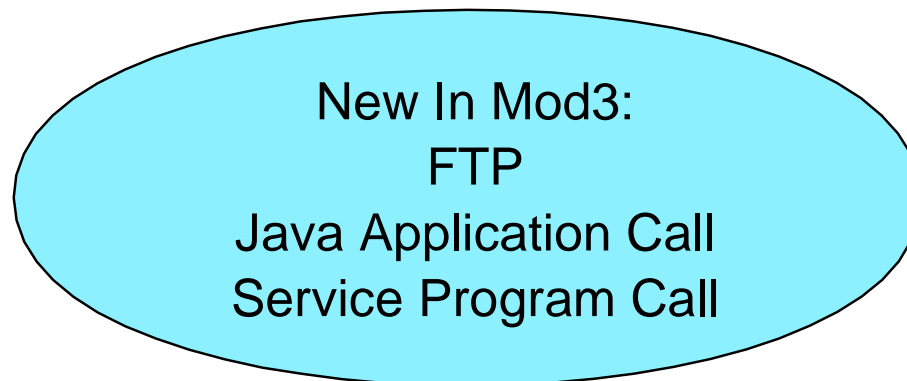
### **Divided into packages:**

- com.ibm.as400.access - APIs for accessing AS/400 data and resources
- com.ibm.as400.vaccess - GUI components
- com.ibm.as400.data - Program call markup language
- com.ibm.as400.ui.\* - Graphical Toolbox
- com.ibm.as400.util.\* - HTML and Servlet classes
- utilities - utility classes such as AS400ToolboxInstaller and JarMaker

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## ***Access Classes: Low-level Java APIs to Access Data***

- User Authentication and Identification
- Command Call
- Data Area
- Data Description
- Data Conversion
- Data Queues
- IFS
- JDBC
- Jobs
- Messages
- Print
- Permissions
- Program Call
- Record-level Database Access
- System Status
- System Values
- Users and Groups
- User Space





## ***"The AS400 object"***

**Represents a connection to the AS/400**

**Provides a sign-on GUI**

- Password caching available
- Change password GUI when appropriate

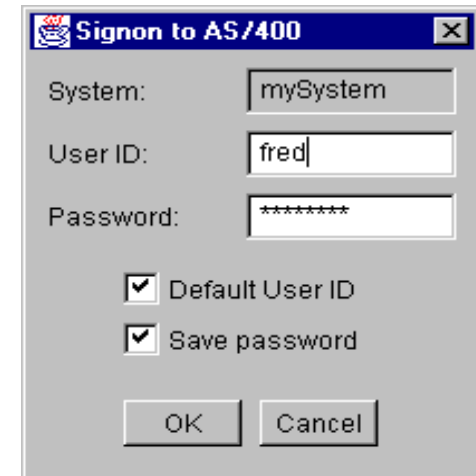
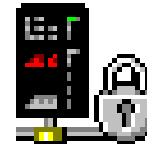
**Controls conversations with server jobs**

- Multiple users and multiple conversations
- Implicit and explicit connections

**Provides Secure Sockets Layer (SSL) communication**

- Encryption and server authentication

***Most Toolbox classes use the AS400 object***

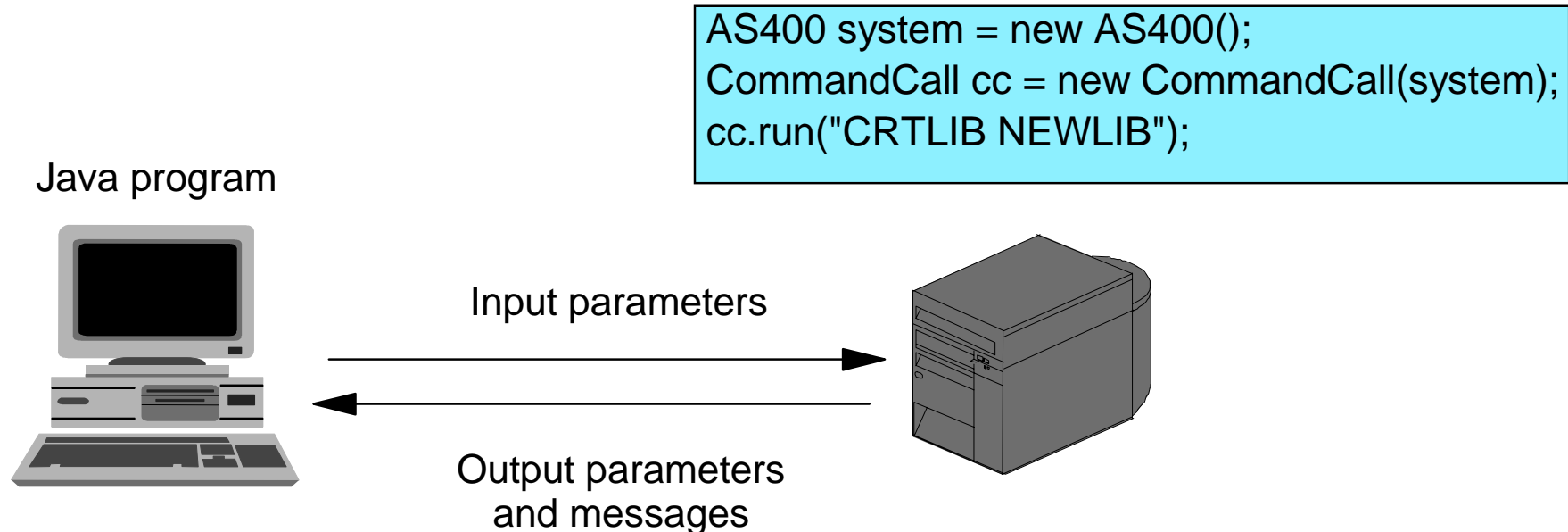


```
AS400 sys  = new AS400();  
AS400 sys2 = new AS400("mySystem");  
AS400 sys3 = new AS400("mySystem",  
                        "myUID",  
                        "myPWD");
```

```
CommandCall cc = new CommandCall(sys);
```

# Command call and program call

## Make use of legacy code and system APIs



```
AS400 system = new AS400();  
ProgramParameter[] parmList = new ProgramParameter[n];  
parmList[0] = new ProgramParameter(data);  
...  
ProgramCall pc = new ProgramCall(system,  
    "/QSYS.LIB/MYLIB.LIB/MYPGM.PGM", parmList);  
pc.run();
```

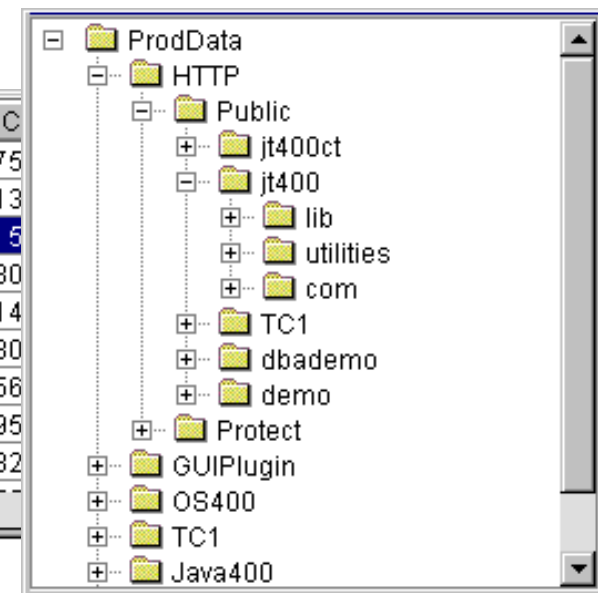
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# AS/400 Toolbox for Java

## Graphical user interface components

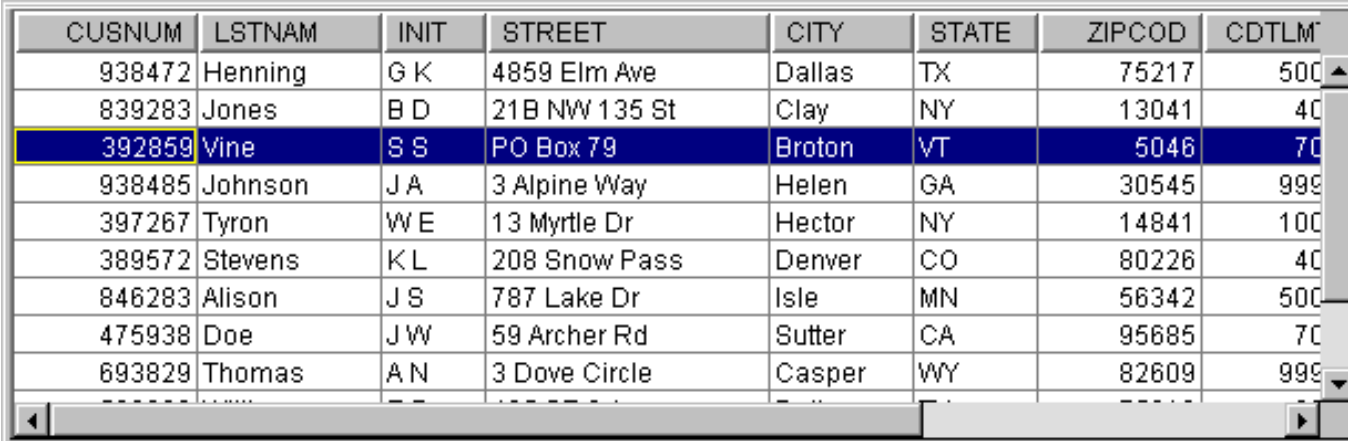
A set of Java Swing (GUI) components which present AS/400 data and resources

CUSNUM	LSTNAM	INIT	STREET	CITY	STATE	ZIPC
938472	Henning	G K	4859 Elm Ave	Dallas	TX	75
839283	Jones	B D	21B NW 135 St	Clay	NY	13
392859	Vine	S S	PO Box 79	Broton	VT	5
938485	Johnson	J A	3 Alpine Way	Helen	GA	30
397267	Tyron	W E	13 Myrtle Dr	Hector	NY	14
389572	Stevens	K L	208 Snow Pass	Denver	CO	80
846283	Alison	J S	787 Lake Dr	Isle	MN	56
475938	Doe	J W	59 Archer Rd	Sutter	CA	95
693829	Thomas	A N	3 Dove Circle	Casper	WY	82



# *SQLResultSetTablePane*

***Use JDBC to present query results***



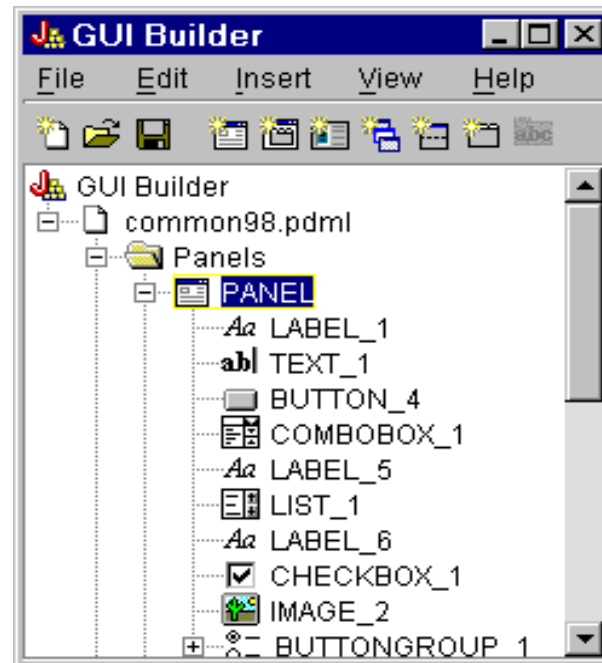
CUSNUM	LSTNAM	INIT	STREET	CITY	STATE	ZIPCOD	CDTLM
938472	Henning	G K	4859 Elm Ave	Dallas	TX	75217	500
839283	Jones	B D	21B NW 135 St	Clay	NY	13041	40
392859	Vine	S S	PO Box 79	Broton	VT	5046	70
938485	Johnson	J A	3 Alpine Way	Helen	GA	30545	999
397267	Tyron	W E	13 Myrtle Dr	Hector	NY	14841	100
389572	Stevens	K L	208 Snow Pass	Denver	CO	80226	40
846283	Alison	J S	787 Lake Dr	Isle	MN	56342	500
475938	Doe	J W	59 Archer Rd	Sutter	CA	95685	70
693829	Thomas	A N	3 Dove Circle	Casper	WY	82609	999

# GUI Builder

## Graphical Toolbox

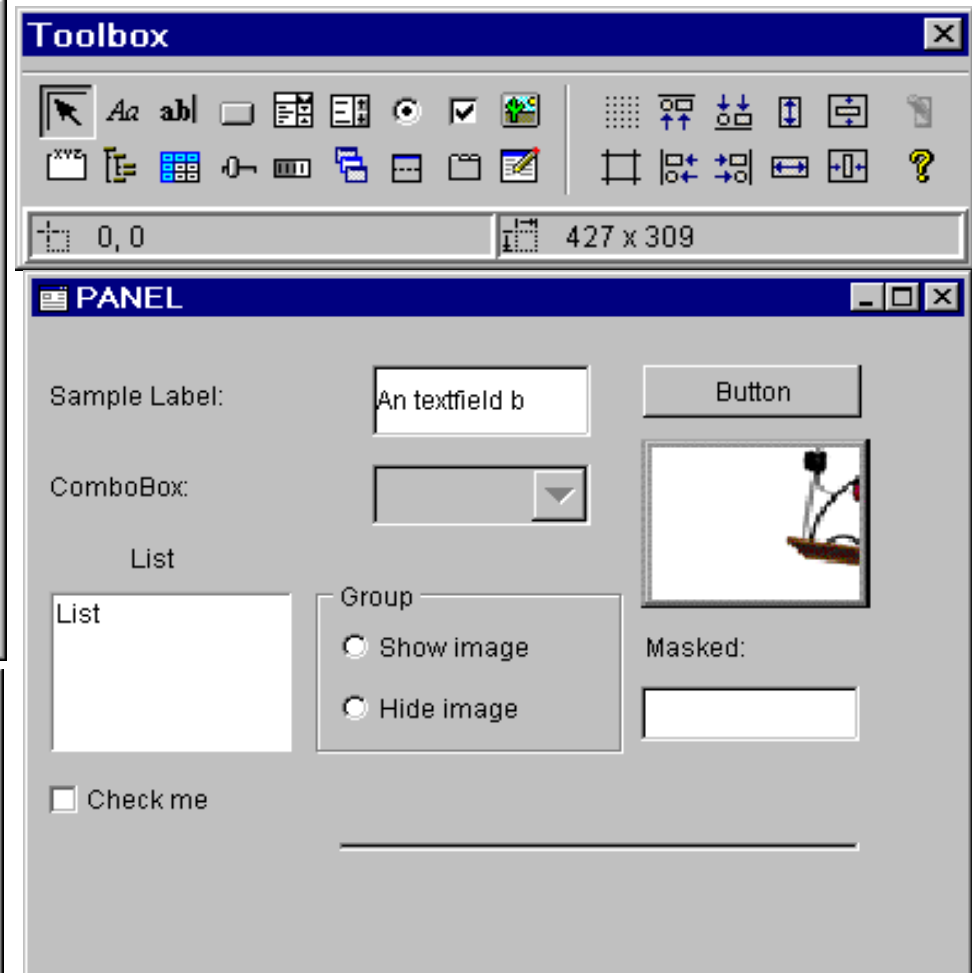
WYSIWYG  
panel  
definition

Generates  
Panel  
Definition  
Markup  
Language  
(PDML) code



The screenshot shows the Properties window for the selected 'PANEL' element. It contains a table with properties and their values.

Property	Value
Element	PANEL
Name	PANEL
Title	Panel
Size	
Width	427
Height	309
Icon	
Activate	
Margins	
Top	18
Bottom	18
Left	18
Right	18
Grid	
Width	18
Height	18

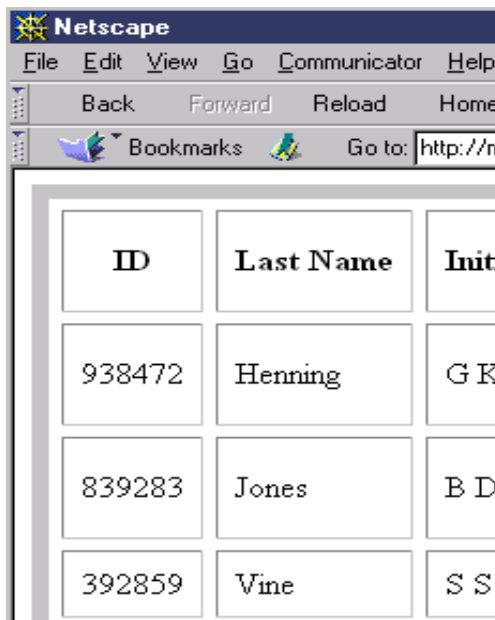


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# HTML and Servlet classes

## Web components create tables and forms

- com.ibm.as400.util.html package
- com.ibm.as400.util.servlet package
- Use servlet classes to get data, then display it in an HTML form or table
- List, details, explorer and tree views
- Implementations for Record Level Access and SQL via JDBC, along with HTMLTableConverters, HTMLFormConverters, and more



ID	Last Name	Initial
938472	Henning	G K
839283	Jones	B D
392859	Vine	S S

```
HTMLTableConverter converter = new  
HTMLTableConverter();  
HTMLTable table = new HTMLTable();  
table.setHeaderInUse(false);  
table.setBorderWidth(8);  
converter.setTable(table);
```

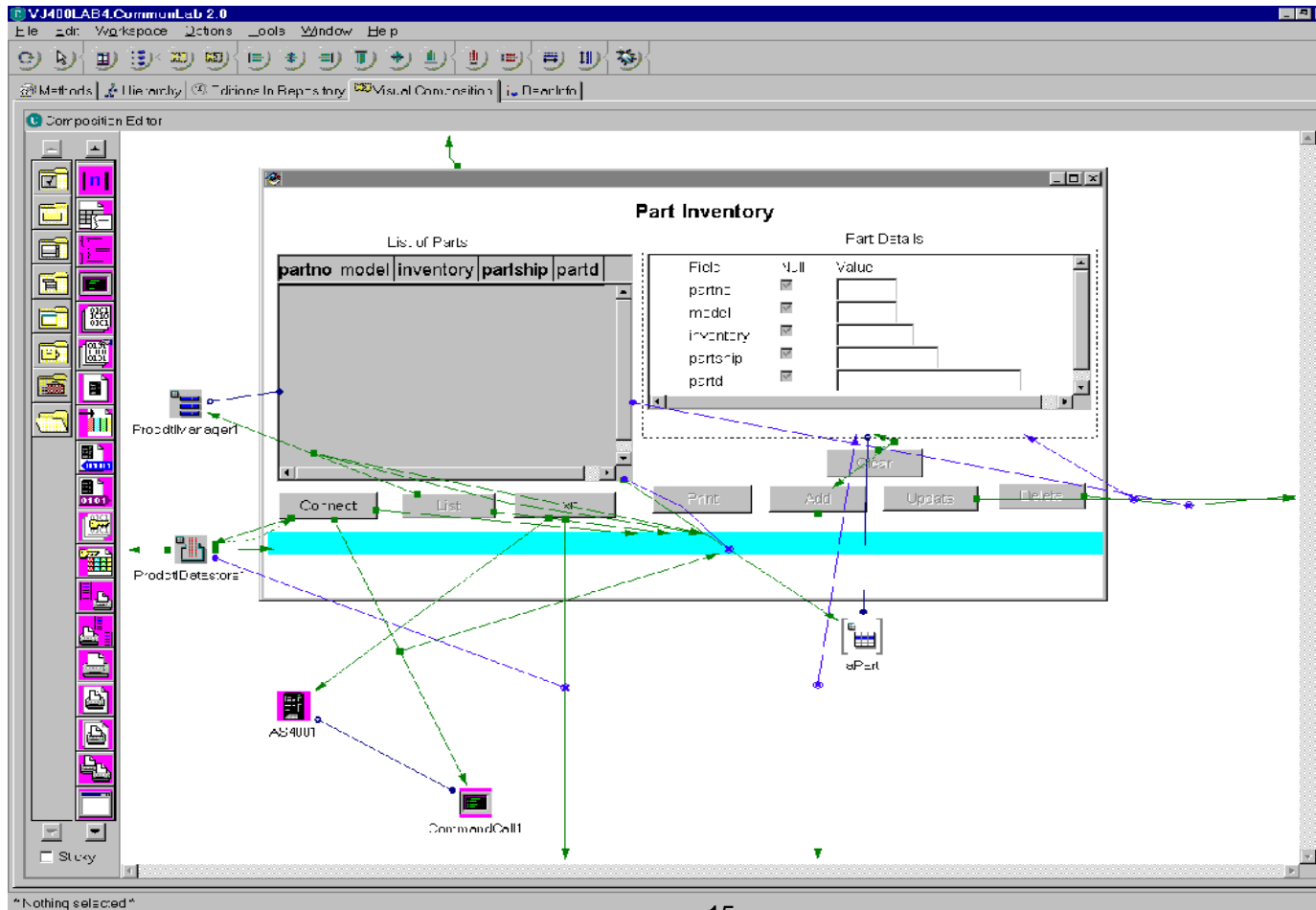
```
ResultSet resultSet = statement.getResultSet();  
SQLResultSetRowData rowdata = new  
SQLResultSetRowData(resultSet);
```

```
String[] html = converter.convert(rowdata);  
out.println(html[0]);
```

# Visual Age for Java

***No coding necessary!***

**Toolbox beans work with many visual development environments**



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## ***Where can I get more information?***



**<http://ibm.com/as400/toolbox>**

- News, downloads, FAQs, service packs, articles, COMMON labs

**<http://oss.software.ibm.com/developerworks/opensource/jt400/>**

- JTOpen - open source, bug reporting, feature requests

**<http://as400service.ibm.com/>**

- AS/400 Technical Forums - including AS/400 Toolbox for Java/JTOpen Forum

### ***AS/400 Toolbox for Java Programmers Guide***

- Shipped with the AS/400 Toolbox for Java
- Contains overview, full API documentation (javadoc), and code examples
- Available at AS/400 Information Center

### ***Building AS/400 Client/Server Applications with Java***

- Redbook SG24-2152-02



# *Open Source*

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**Toolbox source for many components available at**  
***<http://www.ibm.com/developerworks/opensource>***

- Part of IBM's open source development community
- Use source as a debug tool
- Submit new function
- Modify source for your use
- Submit problem reports and bug fixes

## **Two versions of the Toolbox:**

- Licensed program
  - Only IBM developed code
  - Supported by IBM
- Open source version
  - Includes source from non-IBM contributors
  - Supported by open source community