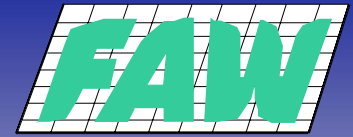


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Multidimensionale Datenbanken und die Anbindung an das Internet mit Java.

**von Michael Haller
Dr. Josef Küng**

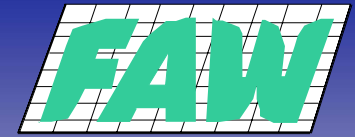
MDDDB und die Anbindung an das Internet



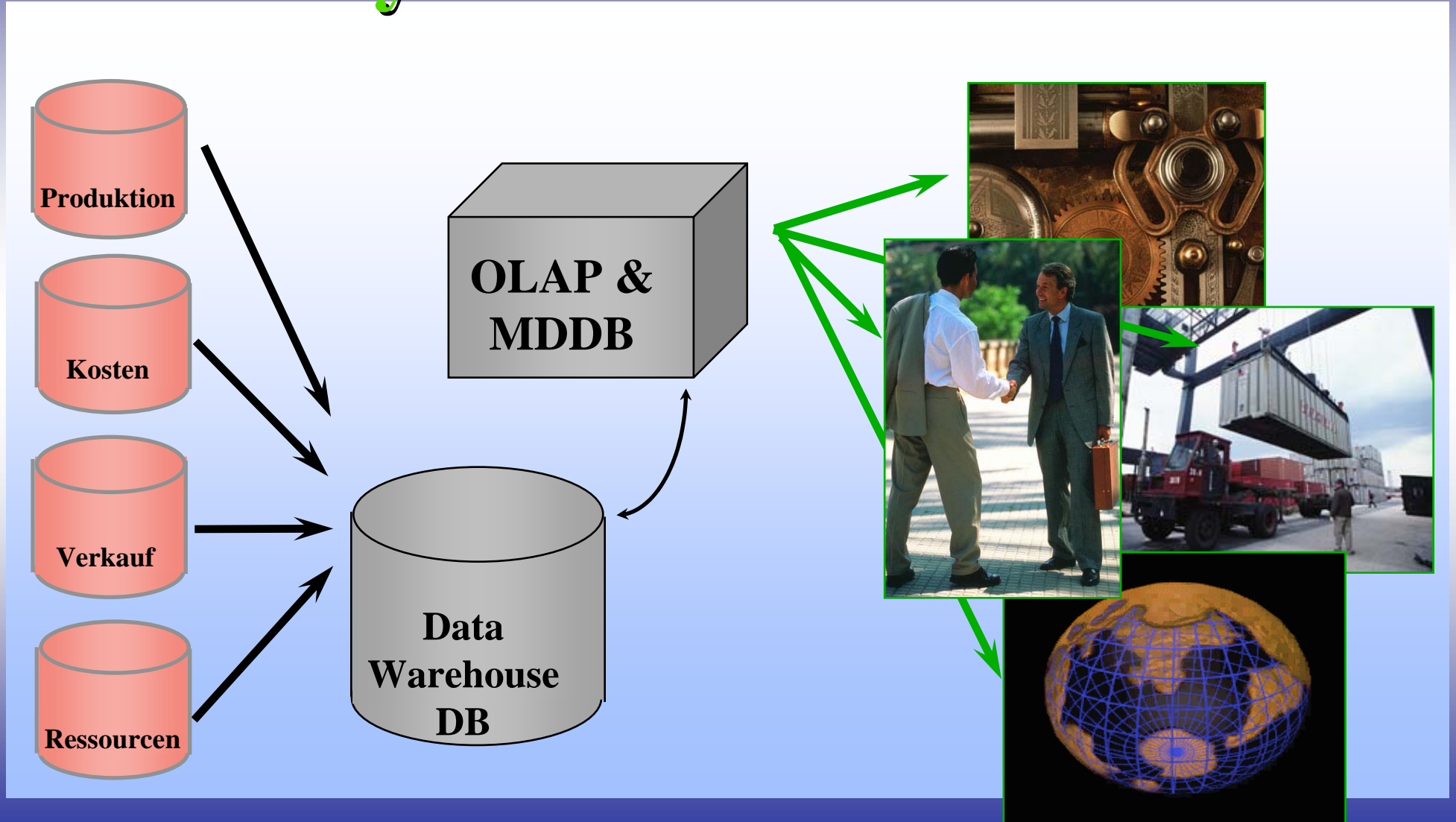
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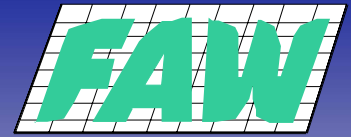
Der Prozeß für die Gestaltung einer analytischen Datenbank



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Multidimensionales SQL



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- ◆ **Derzeit gibt es noch keine einheitliche Abfragesprache (siehe SQL).**
- ◆ **Die existierenden MSQL-Abfragesprachen unterscheiden sich aber nur geringfügig.**
- ◆ **Es gibt noch nicht sehr viele MSQL-Abfragesprachen.**

MSQL - Die Grammatik



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```
MSQL = "SELECT" cell
      "FROM" cube, ",", dimension dimVariable
      {"(",", dimension dimVariable)}
      [WhereStat] ";".
```

```
WhereStat = "WHERE" Condition
           {"(",", Condition)}.
```

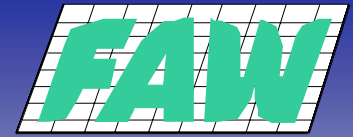
```
Condition = LeftParameter Operator RightParameter
           {"AND" LeftParameter Operator RightParameter}.
```

```
LeftParameter = dimVariable "." position.
```

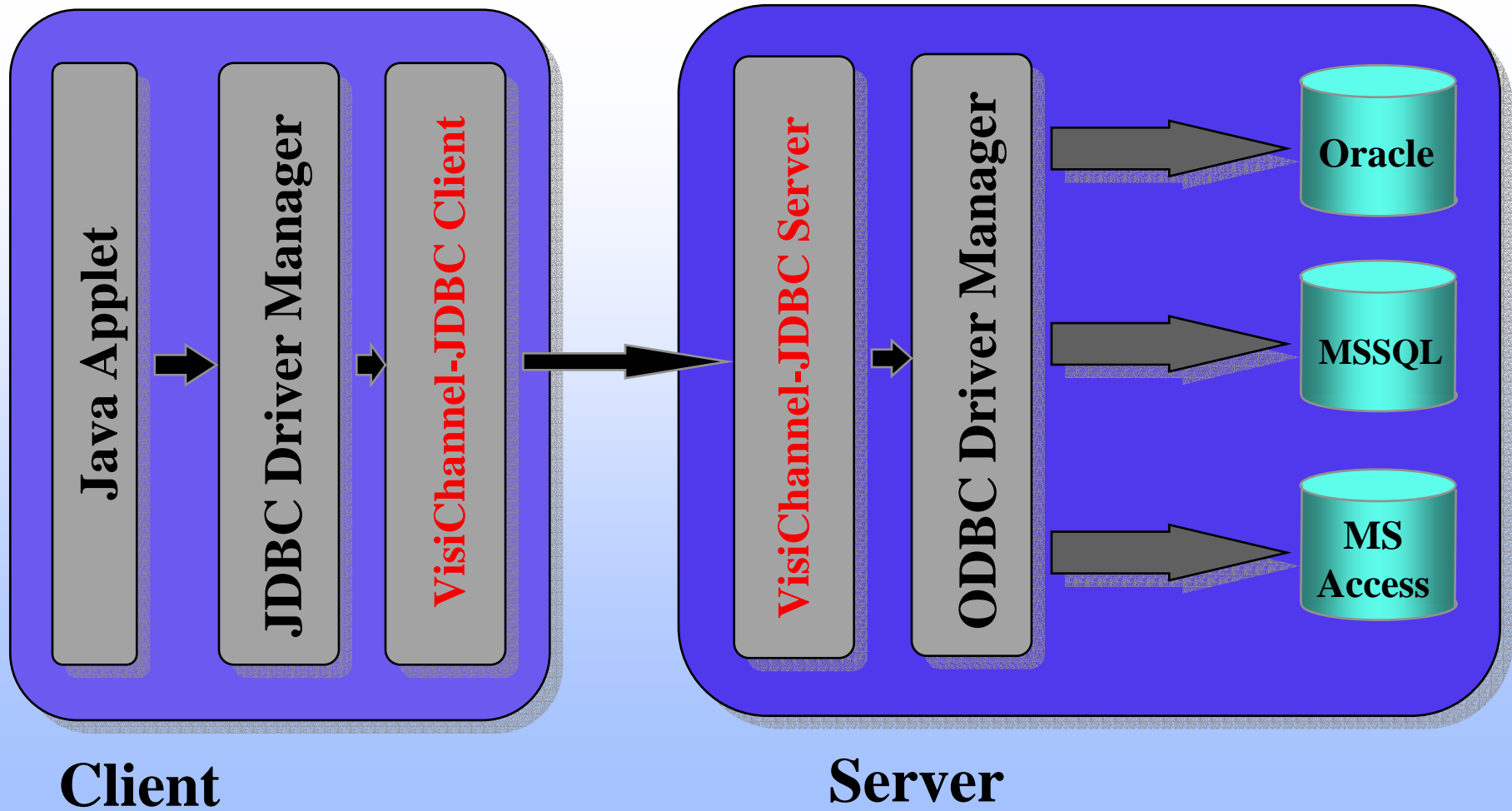
```
Operator = ("="|"!"|">"|"<")"=".
```

```
RightParameter = "`" name "`".
```

Die Architektur



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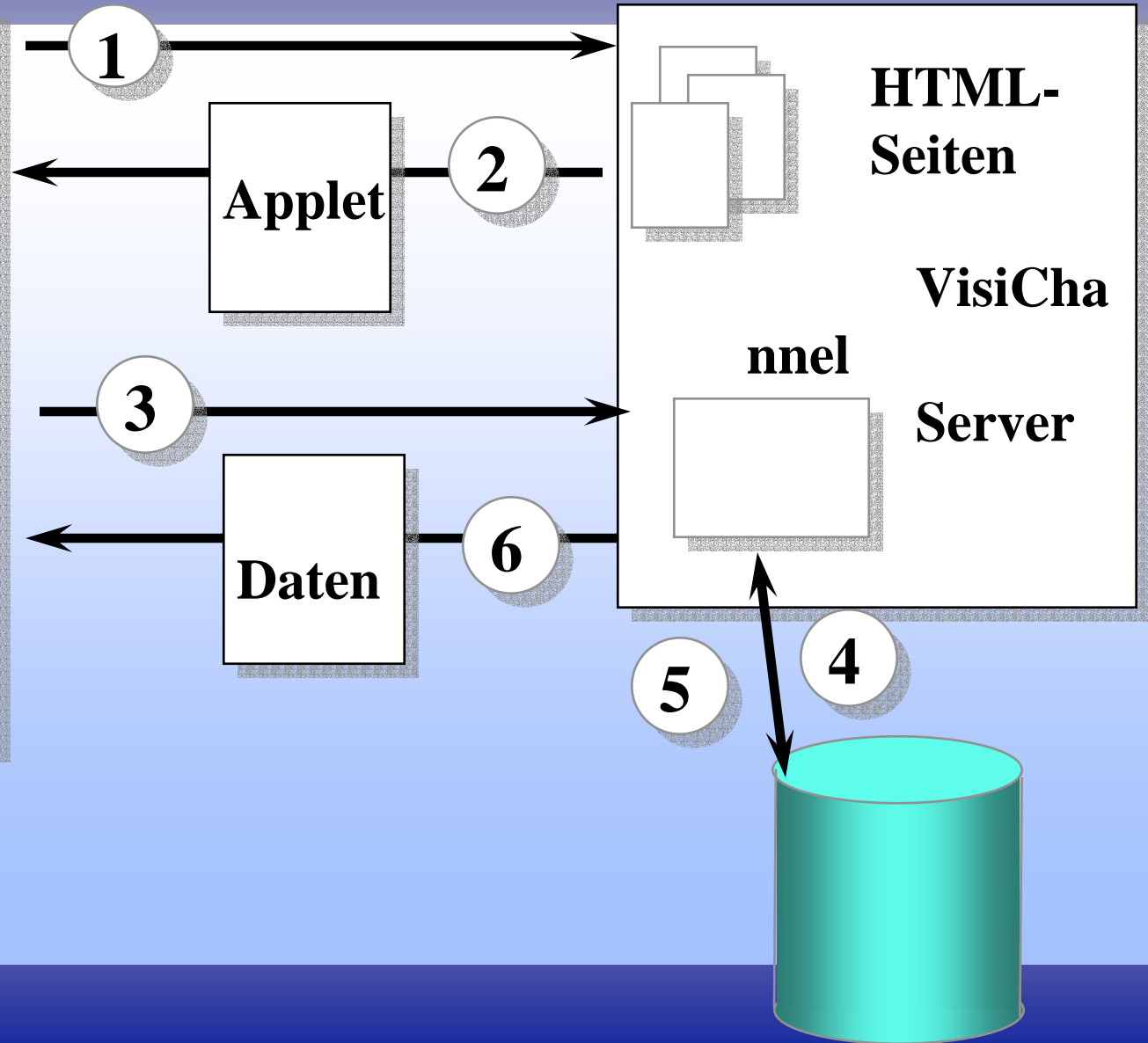
Der Ablauf



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**Web-Browser
VisiChannel-
Client**



WebMDDDB



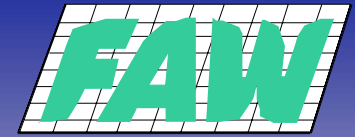
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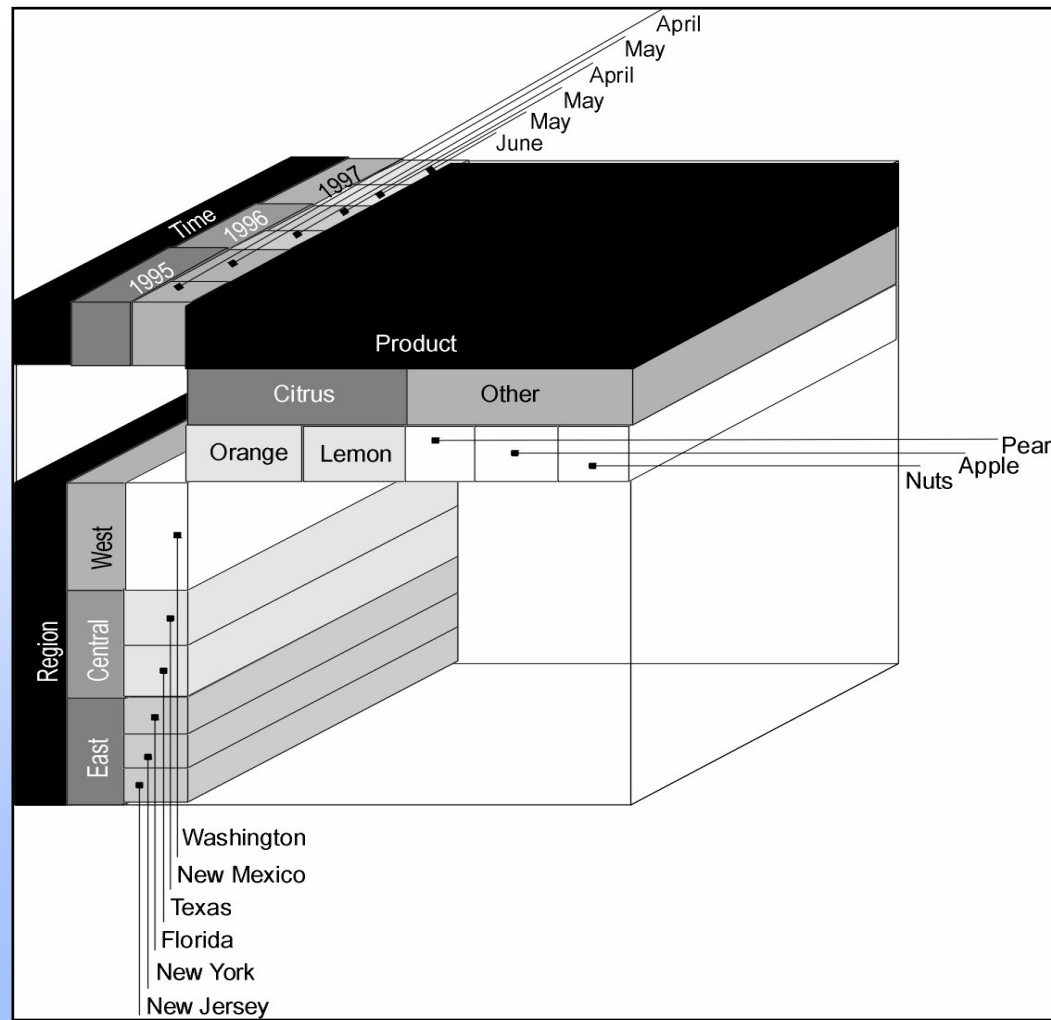
A screenshot of an Applet Viewer window titled 'Applet Viewer: WebMDDDB.class'. The window contains a 'Connect' button (circled in red), a 'Connection Parameters' dialog box (circled in red), and a 'WebMDDDB' applet. The dialog box has fields for 'Server' (merlin), 'Username' (michi), 'Password' (visi), and 'Connect String' (visi). A red arrow points from the 'Server' field to the text 'Server' on the right. Another red arrow points from the 'Connect String' field to the text 'Connect-String' on the right. Below the dialog box are buttons for 'Connect', 'Disconnect', and 'Help'. At the bottom of the window, there is a status bar with the text 'WebMDDDB - Proto (October, 1997)' and a message box that says 'Applet started.'.

Server
Benutzername
Paßwort
Connect-String

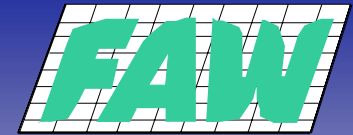
Der 3D-Datenwürfel



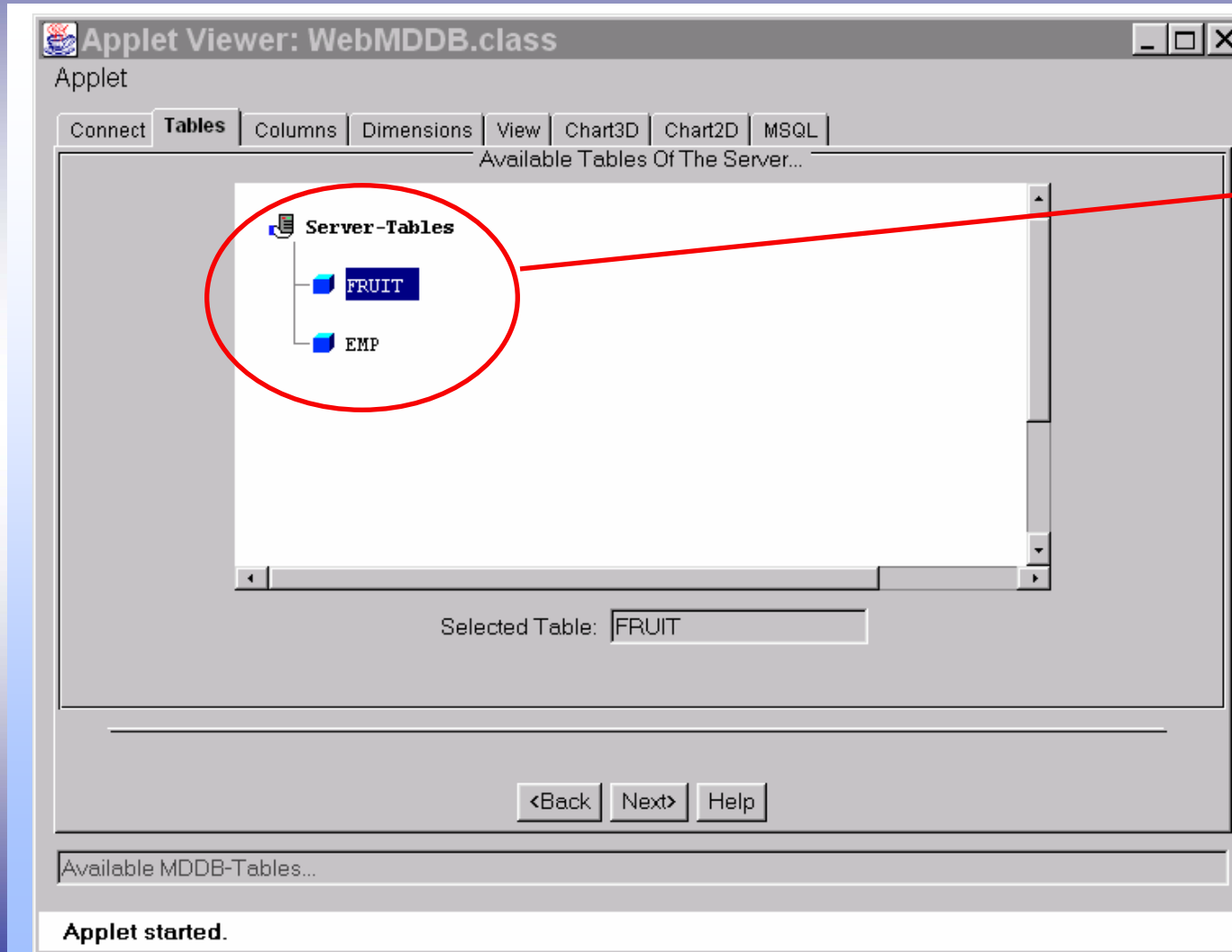
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Die Wahl des Datenwürfels



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Die zur Verfügung stehenden Datenwürfel.

Die Wahl der Dimensionen



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Applet Viewer: WebMDDB.class

Applet

Connect Tables **Columns** Dimensions View Chart3D Chart2D MSQL

Table: FRUIT

Available Columns

PRODUCT
TIME

Selected Columns

REGION

UP DOWN

<Back Next> Help

Available Columns of MDDB-Tables...

Applet started.

Zur Verfügung
stehen...

Weiter...

Ausgewählte
Dimensionen

Die 2D-Darstellung



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Die Schaltflächen der Dimensionen

Applet Viewer: WebMDDB.class

Applet

Connect Tables Columns Dimensions **View** Chart3D Chart2D MSQ

Dim

REGION

PRODUCT

TIME

none

none

none

none

none

none

none

none

The 2D View

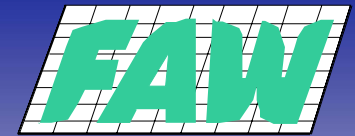
	APPLE	LEMON	NUTS	ORANGE
FLORIDA	128	75	82	72
NEW JERSEY	76	225	79	289
NEW MEXICO	141	271	198	209
NEW YORK	35	172	97	143
TEXAS	66	164	71	78
WASHINGTON	67	81	86	79

View of Query...

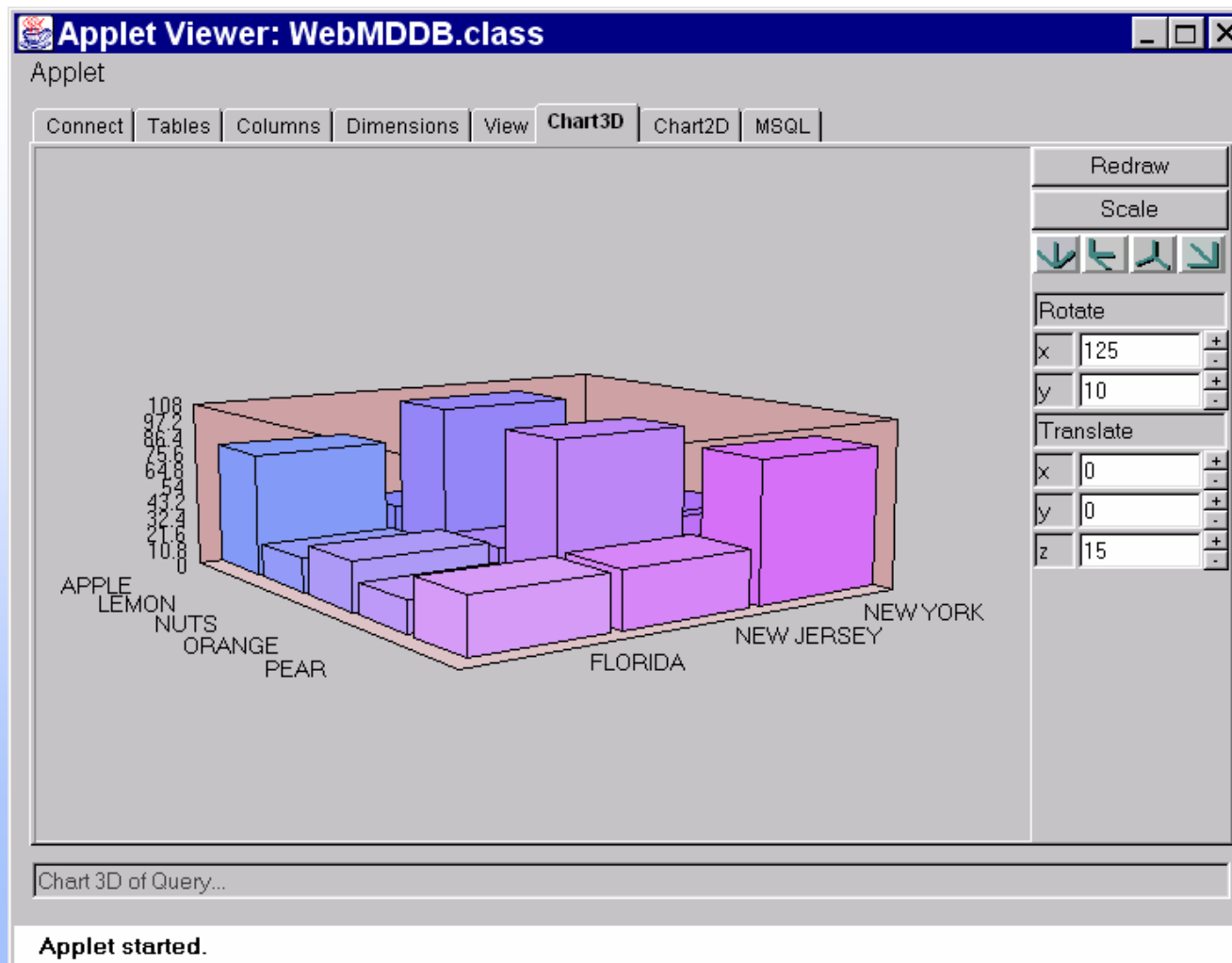
Applet started.

Die Kreuztabelle

Die 3D-Darstellung



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Die Navigation...



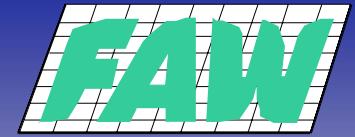
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The screenshot shows a Java Applet Viewer window titled "Applet Viewer: WebMDDB.class". The applet interface includes a menu bar with options: Connect, Tables, Columns, Dimensions (selected), View, Chart3D, Chart2D, and MS SQL. Below the menu bar is a label "Dimension for drill down & roll up...". The main content area displays a tree view titled "Dimension-Hierarchy" with the following structure:

- Dimension-Hierarchy
 - REGION
 - EAST
 - CENTRAL (highlighted in blue)
 - TEXAS
 - NEW MEXICO

Below the tree view, a text field displays "Selected Dimension: CENTRAL". At the bottom of the applet, there are three buttons: "<Back", "Generate", and "Help". A status bar at the very bottom of the window contains the text "Applet started." and a label "Change the Dimension..." above a text input field.

Die Verteilung der Daten



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Applet Viewer: WebMDDB.class

Applet

Connect Tables Columns Dimensions View Chart3D **Chart2D** MSQL

Position
2 / 1

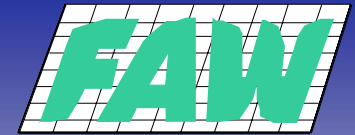
Label
NEW JERSEY
NUTS

Value
27

Chart 2D of Query...

Applet started.

MSQL - Das Fenster



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Applet Viewer: WebMDDB.class

Applet

Connect Tables Columns Dimensions View Chart3D Chart2D **MSQL**

MSQL statement..

```
select sal from fruit, product p, region r, time t
where p.product == 'PRODUCT',
      r.region == 'REGION',
      t.time == 'TIME';
```

Parsing...
Calculating...

	ORANGE	LEMON	NUTS	APPLE	PEAR
NEW YORK	143	172	97	35	158
NEW JERSEY	289	225	79	76	126

Execute Clear Input Clear Output Help

Insert a MSQL Query...

Applet started.

MSQL - Beispiel



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Ges.: Alle Produkteinnahmen aller Regionen im gesamten Zeitraum.

```
SELECT sal FROM fruit,  
        product p, region r, time t  
  
WHERE p.product == 'PRODUCT',  
       r.region == 'REGION',  
       t.time == 'TIME';
```

MSQL - Beispiel

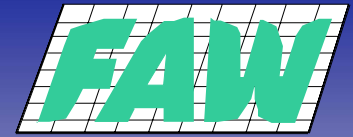


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Ges.: Alle Produkteinnahmen aller östlichen Regionen im Jahre 1997.

```
SELECT sal FROM fruit,  
        product p, region r, time t  
  
WHERE p.product == 'PRODUCT',  
       r.region == 'EAST',  
       t.time == 'T1997';
```

Fragen?



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