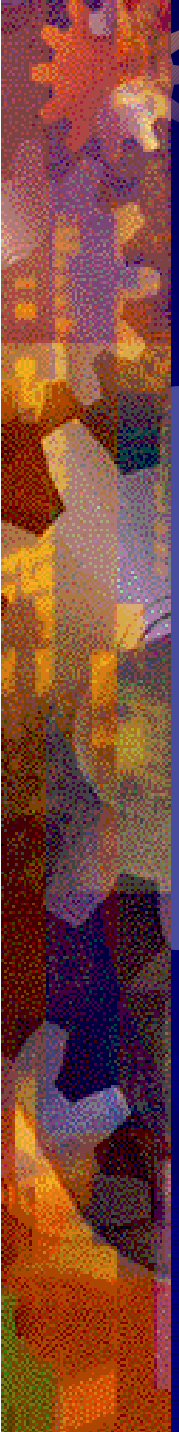
Modules and Objects



Modules

- An alternative to global partitions
- Multiple modules allowed
- Memory mapped files
- Created with SAVE<G>
- Explicitly loaded
  - MODULE ADD/REMOVE

Modules

- Compatibility
  - Try to use local variables
  - Don’t use global scope variables
  - No side effects

Modules

- Shared read-only text
- Shared @ variables still available
  - First module only
- Function search order is load order

Distributed objects

- Black boxes
- Self documenting
- Accessed by methods

Distributed objects

- Client versus Server
  - We (largely) implement a client
- Initial implementation in 5.02 using $DECLARE
  - Too cumbersome
- Easier to program but still not optimal for performance

Objects supported

- COM
- Corba
- SOAP
- Kclient object
- Form objects

COM

- **C**omponent **O**bject **M**odel
- Strategic Microsoft standard
- Aka COM+, ActiveX, OCX and OLE
- Effectively Win32 only
- We support Automation only
  - we act as a client or server

Automation

- Directly access Excel spreadsheets
- Create Word documents
- Access Outlook
- All done with native VBA methods

Corba

- Industry standard under the OMG
  - Now at version 2
- Implementations are called ORBs
- Mostly Unix but also NT
- Alas standard is fuzzy
- Corba 3 is a Java only spec
- KCML can be client or server

SOAP

- Emerging unified standard
- Key Microsoft technology
  - Windows Services
- XML payload
- Use HTTP as transport
- Currently client only

Kclient as an object

- Allows programmatic control of Kclient
  - Set title, minimize
- Sub-object for forms subsystem
  - Controls how graphs are spoofed
  - User-colours and later preferences

Forms objects

- Acts as a shorthand
- Can be used with…
  - Grid cells
  - Tree nodes
  - Listboxes
  - Menus
  - Embedded OCXs

OBJECT notation

- Reserved word OBJECT is a qualifier
  - `DIM OBJECT a, OBJECT myOcx`
  - `OBJECT a = b`
- Objects must be **Instantiated**
  - `OBJECT Doc = CREATE "ClientCOM","Word.Basic“`
  - `OBJECT rsTable = CREATE "ServerCOM", "ADODB.Recordset“`
- Or you reference a running object
  - `OBJECT Range = Sheet.Range()`

OBJECTS

- Release an object by setting to NULL
  - `OBJECT sheet=NULL`
- KCML will release when they go out of scope on LOAD or if LOCAL
- Use WB object browser to see available methods, properties and events
- `OBJECT rsTable = cnConnect.Open("SALES")`

OBJECTS

- Objects can belong to **Collections** and can be enumerated e.g.
- ```
  FOR OBJECT a IN rsTable.Fields()
      PRINT a.Name$, a.Value$
  NEXT OBJECT a
  ```
  ```

OBJECTS

- Objects can define constants
- Prefix with ENUM reserved word

```
rsTable.CursorType = ENUM .adOpenKeyset
record.Open("Customers", OBJECT connect,
  ENUM adOpenForwardOnly)
```

OBJECTS

- Errors are thrown as O30 which is recoverable using ERROR

OBJECTS in forms

- OCX
  - `OBJECT myOCX=form1.controlOCX myOCX.redraw()`
- Grid (great for passing to subroutines)

```
OBJECT thiscell=.grdDB.cell(row, col)
thiscell.text$="Hello"
```

  - ‘SetGridCell(OBJECT thiscell)
- Trees (ditto)

Demos

- Automating Excel
- Using ADO to read an Access table
- Using objects with grids and trees