

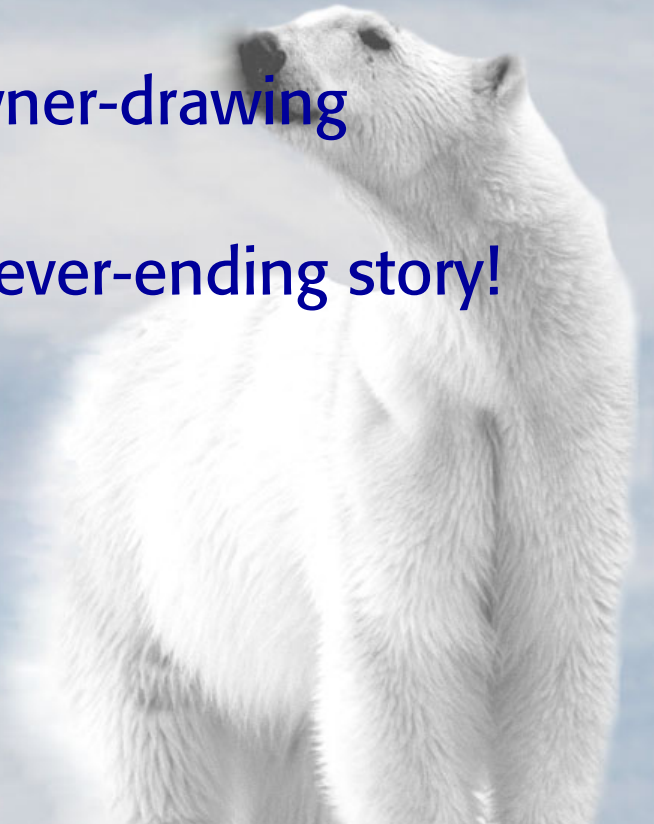


STOP

Assorted Tips and Solutions
for Xbase++ Developers

Agenda

- **ActiveX** – a small guided tour!
- **OOP** – utilized correctly
- **Xbase Parts** – examples for owner-drawing
- **Files in the Network** – a never-ending story!



Windows WMI with SL1

- Windows Management Instrumentation.
- Fields of operation
 - **Hardware:** Win32_1394Controller, Win32_BaseBoard, Win32_Battery, Win32_BIOS, Win32_Bus, Win32_CacheMemory, Win32_CDROMDrive, Win32_CurrentProbe, Win32_DesktopMonitor, Win32_DeviceMemoryAddress, Win32_DiskDrive, Win32_DisplayConfiguration, Win32_DisplayControllerConfiguration, Win32_DMACHannel, Win32_Fan, Win32_FloppyController, Win32_FloppyDrive, Win32_HeatPipe, Win32_IDEController, Win32_InfraredDevice, Win32_IRQResource, Win32_Keyboard, Win32_MemoryArray, Win32_MemoryDevice, Win32_MotherboardDevice, Win32_NetworkAdapter,, Win32_PowerManagementEvent, Win32_Printer Win32_PrinterConfiguration, Win32_PrintJob, Win32_Processor...
 - **Software:** Win32_Account, Win32_AccountSID, Win32_ACE, Win32_BaseService, Win32_BootConfiguration, Win32_ClassicCOMClass, Win32_ClassicCOMClassSetting, Win32_CodecFile, Win32_COMApplication, Win32_COMClass, Win32_ComponentCategory, Win32_Group, Win32_LoadOrderGroup, Win32_LogicalDisk, Win32_LogicalFileSecuritySetting, Win32_LogicalMemoryConfiguration, Win32_LogicalProgramGroup, Win32_LogicalProgramGroupItem, Win32_LogicalShareSecuritySetting, Win32_NetworkClient, Win32_NetworkConnection, Win32_NetworkLoginProfile, Win32_NetworkProtocol, Win32_NTEventLogFile, Win32_NTLogEvent, Win32_OperatingSystem, Win32_OSRecoveryConfiguration, Win32_PageFile, Win32_PageFileSetting, Win32_PageFileUsage, Win32_PrivilegesStatus, Win32_Process, Win32_ProcessStartup, Win32_ProgramGroup, Win32_ProgramGroupOrItem, Win32_QuickFixEngineering, Win32_Registry, Win32_RegistryAction, Win32_Service, Win32_Share...
 - **Applications:** Win32_Patch, Win32_PatchPackage, Win32_Product, Win32_ProgIDSpecification, Win32_Property, Win32_PublishComponentAction, Win32_RemoveFileAction, Win32_RemoveIniAction, Win32_SelfRegModuleAction, Win32_ServiceControl, Win32_ServiceSpecification, Win32_ShortcutAction, Win32_ShortcutSAP, Win32_SoftwareElement, Win32_SoftwareElementCondition, Win32_SoftwareFeature, Win32_SoftwareFeatureAction,, Win32_TypeLibraryAction...
- Almost any piece of information about the platform can be acquired using WMI. WMI is already available since the release of the Windows 2000 (Server) and Windows XP (Workstation)
- Hundreds of examples can be found here:
<http://www.activexperts.com/activmonitor/windowsmanagement/wmi/samples/>

WMI in the field

■ Example: Battery Status

http://www.activexperts.com/activmonitor/windowsmanagement/wmi/samples/hw/#Win32_Battery.htm

```
Set objWMIService = GetObject("winmgmts:\\\" & strComputer & "\root\cimv2")
Set colItems = objWMIService.ExecQuery("Select * from Win32_Battery",,48)
For Each objItem in colItems
    Wscript.Echo "BatteryRechargeTime: " & objItem.BatteryRechargeTime
    Wscript.Echo "BatteryStatus: " & objItem.BatteryStatus
    Wscript.Echo "Caption: " & objItem.Caption
    Wscript.Echo "DeviceID: " & objItem.DeviceID
    Wscript.Echo "EstimatedChargeRemaining: " & objItem.EstimatedChargeRemaining
    Wscript.Echo "EstimatedRunTime: " & objItem.EstimatedRunTime
...

```

■ With Xbase++ 1.90 SL1

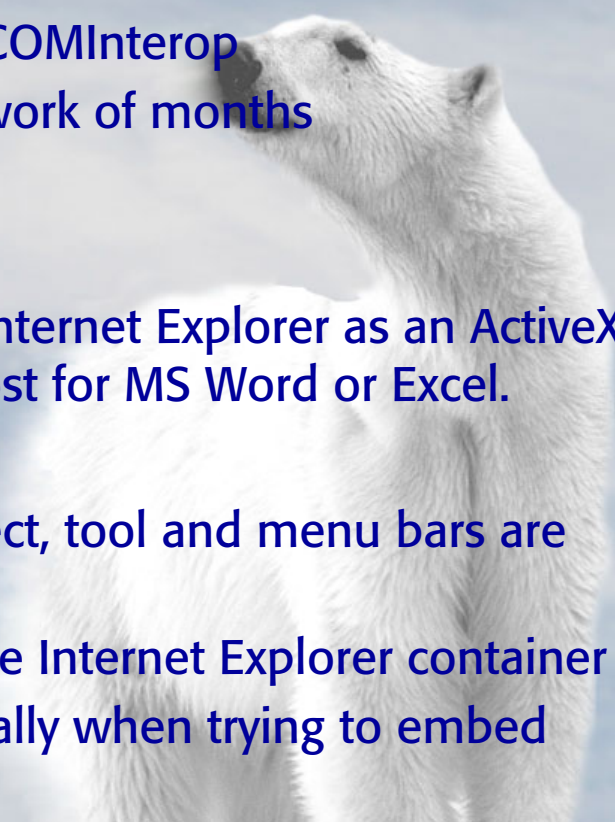
```
// Get information node in WMI tree
oWmiServices := GetObject( "WinMgmts:\\localhost\Root\CIMV2" )
// Execute query via the information token
oBat := oWmiServices.ExecQuery("select * from Win32_Battery",,48)
// Transform Com Collection to array
aBatt := {}
ComEvalCollection(oBat, {|oI| AAdd( aBatt , oI )} )
// Battery Status
? aBatt[1]:DeviceId
? aBatt[1]:EstimatedRunTime,"minutes left"
? aBatt[1]:EstimatedChargeRemaining,"charge % remaining"

```

example

How to embed MS Word and MS Excel

- Problem: MS Word and Excel are OCX documents. They are not ActiveX controls.
 - OCX or Object Embedding was never widely accepted on the Windows platform, mostly due to its inherent complexity. Only VB6 had true support for this technology.
- We, the Xbase++ programmers, are not alone here!
 - .NET only has limited support for ActiveX via COMInterop
 - Implementing an OCX container in C++ is a work of months
 - Delphi OCX-support does not work reliably
- Solution:
 - Utilization of XbpHTMLViewer(), which uses Internet Explorer as an ActiveX control, which in turn functions as an OCX Host for MS Word or Excel.
- Problems
 - Focus management and activation are incorrect, tool and menu bars are not displayed
 - Sometimes documents open up outside of the Internet Explorer container
 - IE is instable and hangs up frequently, especially when trying to embed Word, Acrobat or Excel documents.



MS Word or Excel – do it right now!

- Solution: Microsoft's Developer Support Office Framer Control.
 - The "dsoframer" is an ActiveX Control developed solely and exclusively to function as an OCX Host for OCX documents.
 - Microsoft Knowledgebase Q311765
- How to go about it with Xbase++

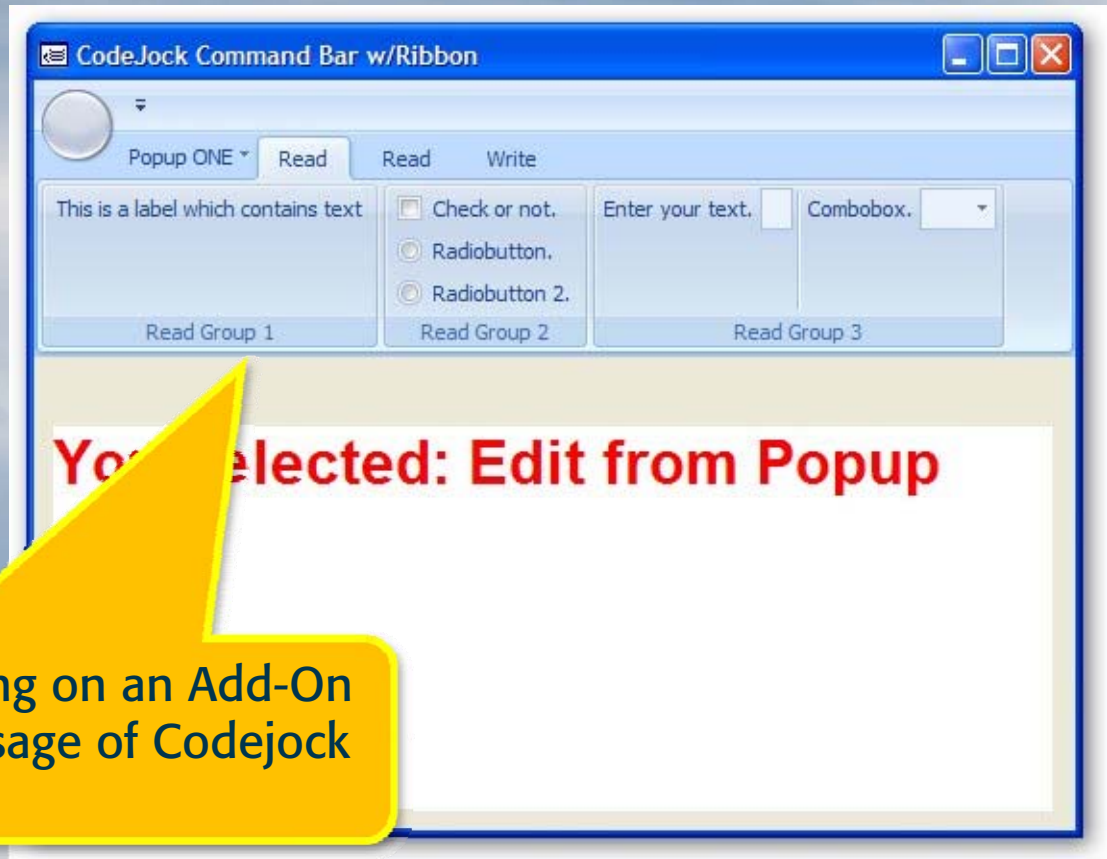
Example



Miscellaneous

- Tablet PC SDK
 - recognition of hand writing and gestures
- Codejock Xtreme Suite
 - UI components with

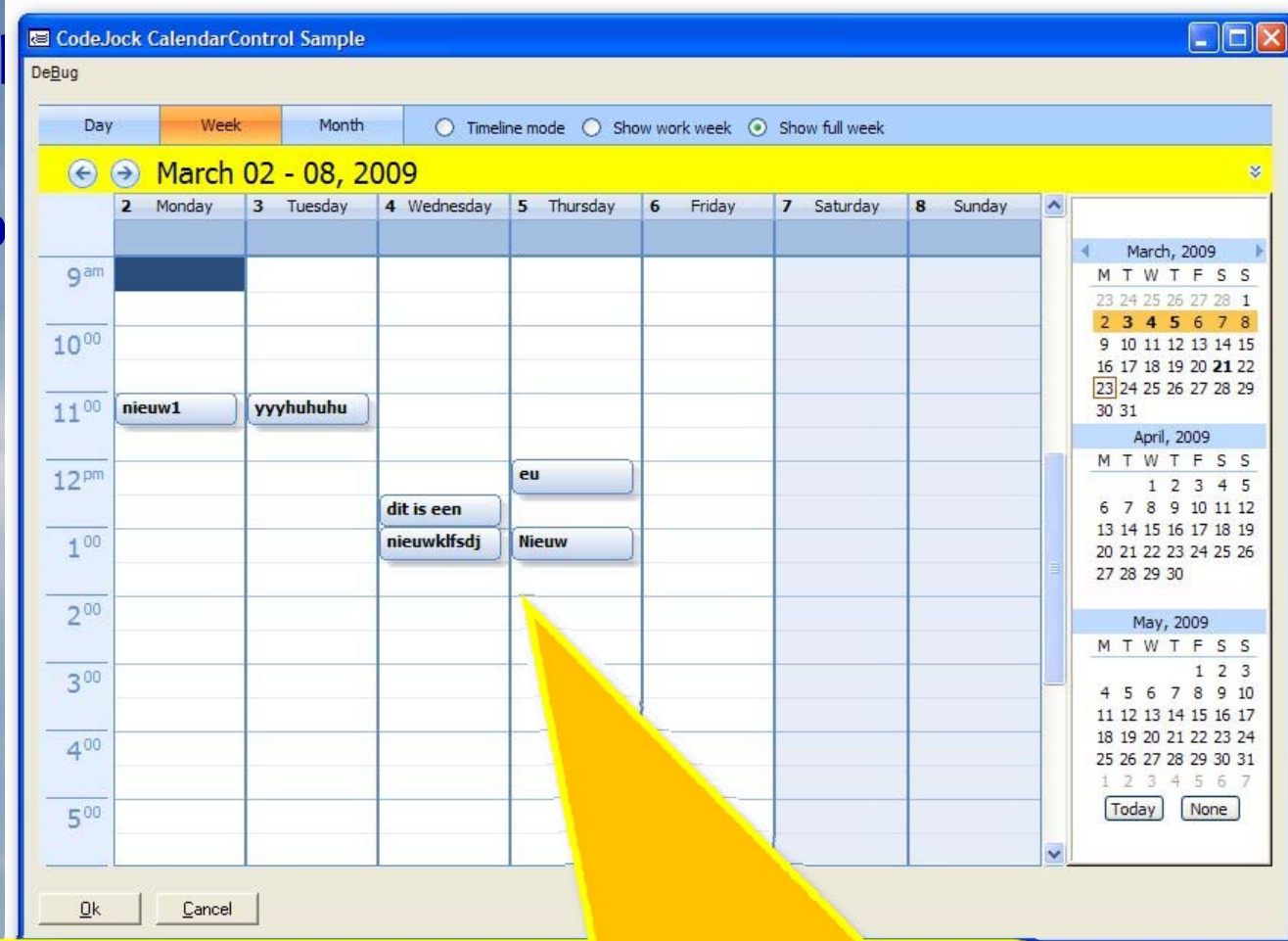
Example



Roger Donnay is currently working on an Add-On for Xbase++ which makes the usage of Codejock easy and snappy!

Miscellaneous

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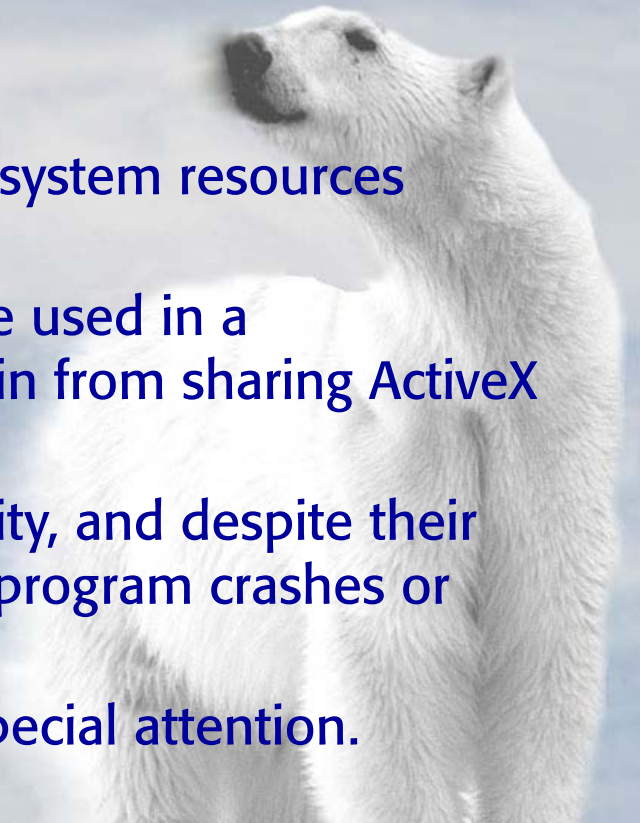
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Roger Donnay is currently working on an Add-On for Xbase++ which makes the usage of Codejock easy and snappy!

Miscellaneous

- **Tablet-PC SDK**
 - recognition of hand writing and gestures
- **Codejock Xtreme Suite**
 - UI components with skin-support
- **Drawbacks of ActiveX:**
 - Generally, ActiveX controls require more system resources compared to an Xbase Part
 - The majority of controls can not safely be used in a multithreading environment; better refrain from sharing ActiveX controls between several threads!
 - Many controls are only of mediocre quality, and despite their pleasant appeal, they frequently lead to program crashes or hang-ups etc.
 - Deployment and maintenance require special attention.

Example



OOP done right!

- PROTECTED vs. EXPORTED
 - PROTECTED: Implementation
 - EXPORTED: Interfaces
- General rules:
 - Export as little as possible! Chaos will reign! Exporting everything results in increased maintenance costs and reduced application quality.
 - **Exported members** (VARs and METHODS) form a unit, generally referred to as a contract/**interface**.
 - An **interface is a guarantee**, which a class issues to its users.
 - A class can have multiple interfaces. Each interface should have its own name.
 - In Xbase++, **interfaces** are defined using **abstract base classes**
 - **Verification** whether or not an interface is supported by a class can be performed via **:IsDerivedFrom** („interfacename“).

example

Note: EXPORTED members are defined for the users of a class. They make up the application interface of a class, and therefore they should never change their semantics /behaviour.

Note: PROTECTED members are part of the implementation of a class. They can only be accessed from within the class or from within derived classes!

OOP - Now more than ever!

INTRODUCE vs. OVERRIDE

- **OVERRIDE:** the default behaviour of Xbase++ is that new methods replace the implementation of the base classes
- **INTRODUCE:** a new method is introduced, no behaviour is changed in base classes.
- **FINAL:** methods of derived classes are per default INTRODUCED and do not replace the behaviour of this class.

General rules:

- The default behaviour of **OVERRIDE** is sufficient for most every-day cases
- Methods, which ought not to be overloaded in derived classes should be declared as **FINAL**.
- Explicitly use **OVERRIDE** whenever you – intentionally - want to break into a base class.
- Those of you using a class library ought to use **INTRODUCE** to avoid unintentional changes of behaviour in methods implemented in base classes.
- **INTRODUCE** can also be utilized to define a new semantic layer within a class framework.

Note: **FINAL** is best to be used for all methods of a class framework required for ensuring integrity.

Note: **INTRODUCE** is to be used for methods for which it is not known whether they exist in a base class. **OVERRIDE** is to be used to change the behaviour of a base class despite **FINAL**.

Xbase Parts and Owner-Drawing

- Basic principles are:
 - Owner-Drawing is a process which allows the developer to draw the visual appearance of a UI element.
 - Owner-Drawing is significantly faster than `:Paint()`
 - Owner-Drawing does not consume any window handles
- Here are four examples:
 - `XbpImageScroller()`
 - `XbpButton(),XbpTab()`
 - `XbpPercentageColumn()`
- Integration into the Form Designer – `xppfd.dat`

example

Xbase Parts and Owner-Drawing

The screenshot displays the Xbase++ FormDesigner interface. The main window shows a form with a caption and a pushbutton. The pushbutton is highlighted with a yellow callout box. The Property Monitor shows the following properties for the selected pushbutton:

Property	Value
Pos	{ 72, 60 }
Size	{ 156, 84 }
ColorFG	** UNDEFINED **
ColorBG	BUTTONMIDDLE
DisabledColorBG	BUTTONMIDDLE
Font	
Visible	TRUE .T.
Enabled	TRUE .T.
ClipSiblings	TRUE .T.
ClipParent	FALSE .F.
ClipChildren	FALSE .F.
TabStop	TRUE .T.
Group	NO_GROUP
IVarName	
Caption	Caption
CaptionLayout	Text Right
TextAlign	Left Centered
ImageAlign	Left Centered

Xbase Part Owner-Drawing:
Pushbutton and TabPage parts with
Text and Icon/Bitmap. Full designable
in FormDesigner.

Xbase Parts and Owner-Drawing

- Group

- C

CAR_ID	PRODUCER	MAKE	COLOR	BUYPRICE	BUYPRICE (%)	BUYDATE	SELLPRICE	SELLPRIC
308634	Lotus	Abode1	Dark Red	12000,00	13%	07.08.19...	54061,00	
535386	Porsche ...	Quattro	Humiliating ...	39002,00	43%	25.09.19...	43292,00	
606768	Rover	Bus	Tin Red	51003,00	57%	21.10.19...	56097,00	
463515	VW	Diesel	Soft Blue	76004,00	85%	23.11.19...	85124,00	
790154	Excalibur	Diesel	Dark Red	49005,00	55%	06.11.19...	53905,00	
578478	Hyundai ...	JLX	Yellow	49006,00	55%	19.08.19...	51946,36	
268227	Chevrolet ...	Pickup	Soft Blue	50007,00	56%	30.11.19...	53507,49	
193701	General M...	WXL	Very Green ...	39008,00	43%	13.11.19...	40958,40	
133519	Mercedes ...	WXL	Pearl White	73009,00	81%	16.02.19...	81039,99	
364696	Jaguar	Quattro	Pearl White	56010,00	62%	06.04.19...	60490,80	
627551	Daihatsu ...	WXL	Soft Blue	31011,00	35%	09.09.19...	35042,43	
900173	Nissan	XJS	Soft Blue	25012,00	28%	03.11.19...	27263,08	
911434	Daihatsu ...	Convertible...	Soft Blue	20013,00	22%	19.09.19...	21814,17	
670949	Nissan	Injection	Soft Blue	39014,00	43%	10.08.19...	42915,40	
914272	VW	UXL	Soft Blue	60015,00	67%	26.04.19...	64816,20	
920040	Hyundai ...	WXL	Soft Blue	82016,00	91%	15.08.19...	91857,92	
119053	Jaguar	TDI	Soft Blue	90017,00	91%	15.09.19...	90218,70	

Entwickler
UI Elements

- Hierarchy

- X

- X

- X

- X

- In

XbpGradientColumn() derived from XbpColumn(). Uses Owner-Drawing to show the percentage value as a gradient bar.

er – xppfd.dat

example

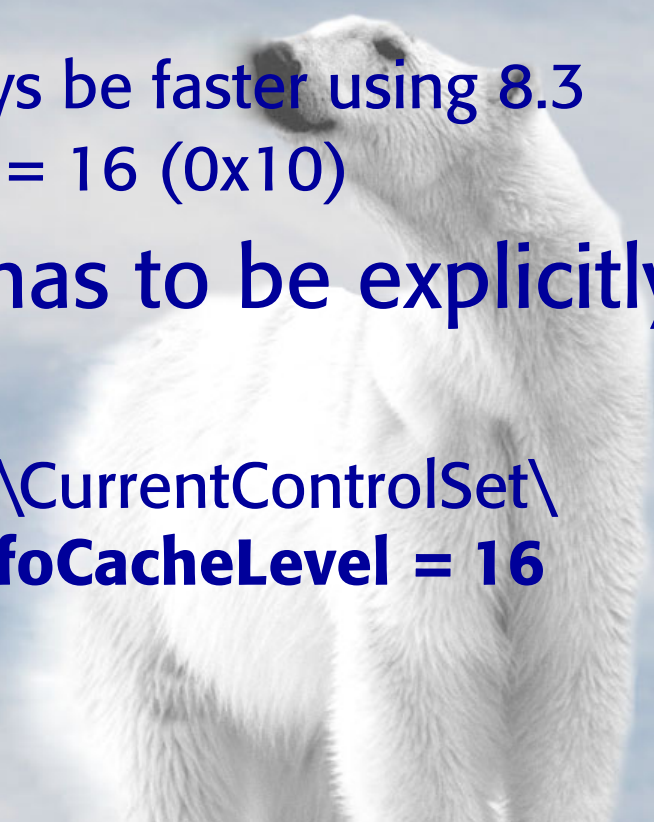
MS File System Quiz

- **Question:** Which essential information of the file system does not get cached per default by the Windows operating system?



MS File System Quiz

- **Question:** Which essential information of the file system does not get cached per default by the Windows operating system?
- **Answer:** Long file names
- **Therefore:** File access will always be faster using 8.3 notation, except for InfoCacheLevel = 16 (0x10)
- Unfortunately, this setting has to be explicitly enabled:
 - HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\MRxSmb\Parameters\InfoCacheLevel = 16
- Q834350 and Q843418



OP Locking & stability of the network

- Absolutely necessary are:
 - OP locking has to be disabled.
 - Microsoft Knowledgebase-ID: Q296264
 - Client: HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\MRXSmb\Parameters**OplocksDisabled** = 1
 - Server: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters\ **EnableOplocks** = 0
 - Anti-Virus software must not be allowed to examine DBF/NTX/CDX/FPT/DBT files.
 - Power-saving mode of the client network card has to be disabled.
 - Auto-disconnect of the server has to be disabled.
 - net config server /autodisconnect:-1 (Q297684)
 - Do not use Vista without SP1!

I/O-Performance

- Typical phenomenon:

- USE of table or index file takes very long (~1s)

- HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters\SharingViolationDelay = 0 (default: 200)
 - HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\LanmanServer\Parameters\SharingViolationRetries = 0 (default: 5)

- DbAppend()/DbCommit() are very slow

- HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Lanmanworkstation\Parameters\DisableFlushOnCleanup = 1

- Hardware

- Good switches and routers are recommended.

- Note:** The latency is the limiting factor, and not the band width!

- Fast harddisks or Raid 0 array.


- Note:** rotation == transaction speed!!



Final notes!

- This presentation, along with most examples demonstrated, will be made available for download at www.alaska-software.com
- The Owner-Drawing samples need some re-work and commenting. We plan to release them for free to any active Subscription customer later on.
- Network- and server infrastructure do significantly determine your application's performance and stability. This holds also true for client/server-based solutions; only there might occur other problems.

Lots of fun while working with Xbase++
1.90 SL1 and the solutions presented in
this paper.



Thanks for your attention

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