XLNT® Command and Scripting Language

XLNT Leverages System Administration for Microsoft Windows

Why a Scripting Language for Microsoft Windows?

"Although GUI tools make small tasks less intimidating for new system administrators, the tools don't work well for enterprise and batch-oriented tasks. For example, retrieving a specific Registry value from hundreds of servers is **not a trivial** undertaking."

Bob Wells, Windows NT Magazine

Today's Situation

"All releases of Windows to date have needed a scripting languages to execute behind-the scenes operations like those you'd attempt with batch files."

The Cobb Group, "Exploring Windows NT"

- With the increase of Windows for Enterprise Computing, the job of administering them becomes significantly more difficult
- Whether it's doing one operation on many machines, or many operations on multiple objects. One thing is certain. GUIs just won't do!

Advanced Scripting and Command Language
XLNT
Windows

The Result:
Many of today's Sys Admin tasks must be solved by scripting ….OR!!!!

Differences between Command and Scripting Languages

- Command Language
  - Commands actually perform the desired tasks
  - Quicker Implementations
  - Less or no requirement to use freeware or shareware utilities to avoid having to write small programs or scripts to implement "missing" functionality
- Scripting Language
  - Usually Interpretative
  - Reusable Procedures
  - Reasonably Functional (varies by make/model)

Languages

- Popular Scripting Languages
  - VBScript, Jscript
  - Perl, Rexx
- Popular Command Language
  - CMD (DOS)
- What if you had a solution that could augment your existing expertise in any of the above languages?

The Advanced Language for Windows 2003 is XLNT®!

- XLNT is an Enterprise command and scripting language that accesses NT components to implement repetitive tasks of System Administration and/or Application Development, without reliance on traditional programming languages and development tools.

XLNT - eXtended Language for Windows 2003

- Advanced Scripting and Command Language
- Designed and Built for Windows
- Extends the features of NT system components
- Allows for integration with other Scripting and Command Languages
- Completely "Network Aware"
- Easy to use

Admin Tasks

- Provide a consistent, automated logon for a mixed Windows environment
  - Connect / map drives
  - Set up printers / shares that are transparent to the user
- Gather hardware/software information from local or remote machines
- Maintain Registry settings (local or remote)
- Perform Security operations on various objects
- Perform daily, weekly, or monthly backups of local or remote machines

Admin Tasks

- Install Printers on Servers and Workstations
- Schedule administrative batch jobs to run daily, weekly, or monthly
- Search for a file document, driver, or program across a network Manage a corporate website running a webserver on Windows 2000/NT
  - Process user input --order forms, literature requests, feedback,
  - Eliminate editing HTML documents everyday

Admin Tasks

- Purge TEMP and Internet Cache directories
- Limit users to a single domain logon
- Migrate Software Products or changes to other machines either using Microsoft's SMS more efficiently -or- avoiding "super" logon scripts

XLNT - Common

- All Commands share a common, easy-to-understand syntax
- Parameters and Qualifiers (one or list)
- All Commands support output redirection
- Groups of commands share common qualifiers (i.e. /since, /before)
- Support of UNC specification applies to non-file related objects as well (i.e. Registry)

XLNT - Commands

- Commands
  - Active Directory (CREATE, MODIFY, DELETE, SHOW)
  - File-Oriented (APPEND, COPY, RENAME, DIRECTORY, etc)
  - Services (INSTALL, START, STOP, etc)
  - Distributed File System
  - Printer Management (INSTALL, DELETE, DEFAULT, etc)
  - Shares
  - Security (User, Group, Policies)
  - Security (Object Permissions) (SET/SHOW PERMISSIONS)
  - Intersystem communication (TELNET like)
  - System Information

Sample XLNT Commands

- Show System
- Show Process
- Set & Show Permissions
- Security
- Services
- Foreign Commands
- Share

XLNT Command Examples

- Access the SAM:
  - SECURITY CREATE USER Njones /DOMAIN ...
- Access Windows Share Objects:
  - SHARE ADD NTSERV /PATH=C:\MYDRIVE /TYPE=DISK
  - DISCONNECT SESSION /USER=Njones
- Access File Objects
  - SEARCH \\COMPA\C$\SOURCE*.cpp "#include"
  - SET PERMISSIONS C:\TEST /ACCOUNT=GUEST:READ
- Access Performance Data
  - SHOW SYSTEM /ON=COMPA

XLNT - Network Aware

- 99%+ of XLNT's commands support the /ON qualifier…
  - This means that commands can be targeted to another machine for execution
  - Key: You don't need XLNT on that machine!
  - Benefit: Saves you time and money
- If you need to run scripts on other machines, get an XLNT Run-Time License!

XLNT - Scripting

- Script Language
  - Variables (typeless or declarative, varying datatypes)
  - Text Operations
  - Built-In Functions
  - Operators
  - Procedures
    - Sequential text file that contains one or more XLNT or CMD/DOS commands, statements, functions, etc.

Sample XLNT Procedure
Add LPR Port

```
$ inquire fqdm "Enter name of server machine "
$ inquire prtq "Enter name of printer on "fqdm'"
$ addcmdtmo=f$addregistry ("HKLM",
      "SYSTEM\ControlSet001\Control\Print\Monitors\LPRPort\Ports\"fqdm':"prtq'\ Timeouts\
      CommandTimeout", "REG_DWORD",%x78)
$ adddattmo=f$addregistry ("HKLM",
      "SYSTEM\ControlSet001\Control\Print\Monitors\LPR Port\Ports\"fqdm':"prtq'\ Timeouts\
      DataTimeout","REG_DWORD",%x12c)
$ addprtq=f$addregistry ("HKLM",-
      "SYSTEM\ControlSet001\Control\Print\Monitors\LPR Port\Ports\"fqdm':"prtq'\ Printer
      Name", "REG_SZ",""prtq"")
$ addmac=f$addregistry ("HKLM",
      "SYSTEM\ControlSet001\Control\Print\Monitors\LPRPort\Ports\"fqdm':"prtq'\Server Name",
      "REG_SZ",""fqdm"")
$ exit
```

XLNT Built-in Functions

- Built-in "Value-Added" XLNT Function
  - F$function-name([args,...])
  - Allows for a LEXICAL function to be invoked wherever symbols or expressions are used.
  - NT Component Lexicals
    - A=F$LOOKUPREGISTRY ("HKEY_CURRENT_USER", "SOFTWARE\ASCI\MYKEY\VALUE-NAME",returned_type, returned_value)
    - Domain = F$ENUMDOMAIN ()
  - String Parsing Lexicals
    - P1 = "MyFileName.Doc"
    - FILENAME = F$EXTRACT(0,F$LOCATE(".",P1),P1)

Some of XLNT's Functions

- F$DIRECTORY - returns the current directory string
- F$EDIT - performs string editing
- F$ELEMENT - extracts an element from a string of elements
- F$EXTRACT - extracts characters from a string
- F$LENGTH - returns the length of a string
- F$LOCATE - locates substrings
- F$MODE - returns current command mode
- F$PARSE - parses file specifications
- F$PID - returns local/remote PID
- F$READEVENT - read NT Event Log
- F$REPORTEVENT - write NT Event Log
- F$SEARCH - searches directories
- F$TIME - returns current date and time as a string
- F$LOCALTIMEZONE - returns information about the user's local time zone.
- F$UTCTIME - returns UTC date and time, formatted in absolute time format.
- F$FORMATDATE - returns a date string in various formats
- F$FORMATTIME - returns a time string in various formats
- F$GETDVIEX - extended form of the
- F$GETDVI lexical, which obtains device information F$INTEGER - returns the integer equivalent of the specified expression
- F$STRING - returns the string equivalent of the specified expression
- F$CVSI - converts specified bits of a character string to a signed integer
- F$CVUI - converts the specified bits of a character string to an unsigned integer
- F$LOADLIBRARY - loads a dynamic link library

Additional XLNT's Functions

- F$CHECKLIBRARY - determines if a specific DLL has been loaded
- F$FREELIBRARY - releases a loaded DLL
- F$ADDREGISTRY - adds a subkey and value to the registry
- F$LOOKUPREGISTRY - looks up a key and values in the registry
- F$DELETEREGISTRY - deletes a value from the registry
- F$CHANGEREGISTRY - modifies a value in the registry
- F$FORMAT - formats a character string
- F$MESSAGE - converts a status code to a formatted message string
- F$MSGBOX - display Windows Dialog box
- F$SERVICE_STATUS - NT Service Info
- F$GETVARIABLE - retrieves an environment variable
- F$GETDVI - returns information about a specific device
- F$GETSYI - returns system information
- F$GETJPI - returns information about a specific process
- F$ENUMDOMAIN - enumerates domain information
- F$ENUMMACHINE - enumerates machine server information
- F$ENUMSHAREPOINT - enumerates network share information
- F$FILE_ATTRIBUTES - returns information on specified file
- F$TYPE - returns the datatype of a symbol

XLNT -- ActiveX

- Windows Scripting Host (WSH) and ActiveX support (including IIS and WSH V2)
  - WSH is the Microsoft independent scripting host
  - XLNT supports integrated ActiveX and COM usage
  - XLNT supports WSH methods
  - XLNT can be directly invoked and manipulated (symbols, etc) from any program

XLNT -- Developer

- Interactive Development Environment
  - Modeled after Developer Studio
  - Language Oriented Editor featuring use of color
  - Debugger
- XC "compile" command
  - Produces .EXE image
  - Image can't be modified
  - Provides source-level security of script (intellectual property)

XLNT -- Interoperability

- CMD/DOS from XLNT
  - Transparent Foreign Command Support (user preference)
  - CMD/DOS Commands are supported within XLNT procedures
  - XLNT Error Handlers can be used with CMD/DOS commands
  - Invoke a CMD/DOS utility by file association
- XLNT from CMD/DOS
  - Add XLNT commands to existing CMD/DOS BAT scripts
  - Use XLNT's Extended Features while under CMD/DOS

XLNT -- File Related

- All File Related Functions support
  - Local and Remote access
  - Standard Windows Security
  - Extensive wildcards, UNC and URL specifications:

    c:\…*.dat

    \\machine\c$\test\…*.htm*

    ftp://ftp.advsyscon.com/xlnt386.exe
  - All Windows date formats and file date fields (Access, Create and Write)
  - Absolute, Delta & Combination times -- supporting various time formats

File Deletion Script Comparison

- The Task:
  - To delete files older than the specified number of days from the specified device/directory
- Languages:
  - Visual Basic
  - XLNT

Delete Files via Visual Basic

```
Attribute VB Name = "Module1"
Declare Sub Sleep Lib "kernel32" (ByVal dwMilliseconds As Long)
Sub Main ()

DelOld.Show

On Error GoTo CommandError

i% = InStr(Command$, " ")
Path$ = Left$(Command$, i% - 1)
Days% = Val(Mid$(Command$, i% + 1,  99))

On Error GoTo 0

j% = 0
Do
      i% = j%
      j% = InStr(i% + 1,  Path$,  "\")
Loop While j% > 0
```

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Visual Basic (cont'd.)

```
If  i% <= 0 Then
    MsgBox "Could not find any backslash (" + Chr$(34) + "\" + Chr$(34) -
          + ")  in the path.  Aborting",  vbCritical, "Error"
    GoTo Finish
End If

Directory$ = Left$(Path$, i% - 1)
FileWildcard$ = Mid$(Path$, i% + 1, 255)

DelOld.Print "Searching directory:"
DelOld.Print "   " & Directory$
DelOld.Print "Searching files: " & FileWildcard$
DelOld.Print "Deleting files older than " & Days% & " days"

If Days% < 0 Then
  MsgBox  "The number of days given in the second command line parameter was
found to be " & Days%
  & ".  However,  it must be a positive number of days.  Aborting",  vbCritical,
"Error"
     GoTo  Finish
End If
```

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Visual Basic (cont'd.)

```
If Mid$(Directory$, 2, 2) <> ":\"  Then
   MsgBox "The path given in the first command line parameter must begin with a
        drive letter, a colon and a backslash. " & "Aborting", vbCritical, "Error"
   GoTo Finish
End If

On Error GoTo DriveError
ChDrive Directory$
On Error GoTo 0

ChDir Directory$
If CurDir$ <> Directory$ Then
   MsgBox "Could not change to directory/path: " & Directory$ & Chr$(13) & Chr$(10) &
   "Aborting", vbCritical, "Error"
   GoTo Finish
End If
```

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Visual Basic (cont'd.)

```
FileName$ = Dir$(FileWildcard$)

DeletedFiles% = 0

If FileName$ <> "" Then
   Do
      If Not DelOld.Visible Then End
      DoEvents
      If Now - FileDateTime(FileName$) > Days%  Then
         DelOld.Print "Deleting: " & FileName$
         DelOld.Refresh
         Kill FileName$
         DeletedFiles% = DeletedFiles% + 1
         DeletedFilesOnThisScreen% = DeletedFilesOnThisScreen% + 1
         If DelOld.CurrentY >= DelOld.Height - 1000 Then
```

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Visual Basic (cont'd.)

```
            Seconds% = 6  * DeletedFilesOnThisScreen%
            If Seconds% > 30 Then Seconds% = 30
            DelOld.Print "Waiting " & Seconds% & " Seconds..."
            DelOld.Refresh
            Sleep 1000# * Seconds%
            DelOld.Cls
            DeletedFilesOnThisScreen% = 0
          End If
        End If
        FileName$ = Dir$
    Loop While FileName$ <> ""
End If

DelOld.Print DeletedFiles% & " Files deleted.  Normal program end."
Seconds% = 6 * DeletedFilesOnThisScreen%
```

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Visual Basic (cont'd.)

```
If Seconds% > 30 Then Seconds% = 30
DelOld.Print "Waiting " & Seconds% & " Seconds..."
DelOld.Refresh
Sleep 1000# * Seconds%
GoTo Finish

CommandError:
Resume CommandError2
CommandError2:
If Command$ = "" Then
   MsgBox "Required command parameters not entered"
Else
   MsgBox "Found command line parameters"
End If
GoTo Finish
```

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Visual Basic (cont'd.)

```
DriveError:
Resume DriveError2
DriveError2:
MsgBox "Could not change to drive " * Left$(Path$, 2) & Chr$(13) &
Chr$(10) &
      "Aborting", vbCritical, "Error"
GoTo Finish

Finish:
End
End Sub
```

Delete Files via XLNT

```
$ delete/log/before=-'p1'- 'p2'\*.*
$ exit
```

"p1" is the first parameter (days) and
"p2" would be the directory specification

XLNT - Functions

- User Defined Functions
  - Provides extensibility to the language
  - Allows inclusion of all Win32 and user-written API functions
  - Accessed through the DECLARE statement
  - Function Support
    - Ability to invoke any routine in any DLL
    - FUNCTION PROTOTYPE
    - DECLARE FUNCTION datatype name library [argument,...[options]
  - Loading the DLL the function resides in
  - Invoking the Function

Remote System Reboot

- The following is a script that reboots a Windows computer.
- This example, Reboot.xcp, shows how XLNT can directly call Win32 API functions.

Remote System Reboot

```
$ NULL[0,8]=%x00
$ base = F$GETVAR("WINDIR")
$ INQUIRE COMP_NAME "Machine to reboot "
$ if comp_name .eqs. "" then abort "Machine-name must be specified."
$ INQUIRE SHUT_TIME "Seconds to shutdown [5] "
$ if shut_time .eqs. "" then shut_time="5"
$ stop_time=f$integer(shut_time)
$ inquire reboot_restart "Restart after Reboot [Y] "
$ reboot=1
$ if reboot_restart .eqs. "" then reboot_restart="T"
$ if .not. reboot_restart then reboot=0
$ DECLARE FUNCTION dword "InitiateSystemShutdownA" advapi32
    string,string,dword,dword,dword STDCALL
```

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Remote System Reboot

```
$ VER32 = 0
$ IF .NOT. F$CHECKLIBRARY("base'\SYSTEM32\advapi32.dll")
$ THEN
$   VER32=F$LOADLIBRARY(""'base'\SYSTEM32\advapi32.dll")
$   IF .NOT. VER32  THEN ABORT "$LOADLIBRARY failed for
    advapi32.dll"
$ ENDIF
$ x = COMP_NAME+NULL
$ xm = "SHUT DOWN by Remote Site ''$local_machine'
    User:''$USERNAME'"+NULL
$ REPLY = InitiateSystemShutdownA(x,xm,stop_time,1,reboot)
$ WRITE $STDOUT "The Action resulted in: ''REPLY'"
$ if VER32 then RESULT = F$FREELIBRARY(VER32)
$ EXIT
```

Sample Windows-specific Command Groups

- User Management
- Object Security
- Service Management

User Management

Control and Maintain Windows User, Group and Policy level security:

- **SECURITY CREATE**
- **SECURITY MODIFY**
- **SECURITY DELETE**
- **SECURITY SHOW**

SECURITY SHOW

$ security show user test /domain /full

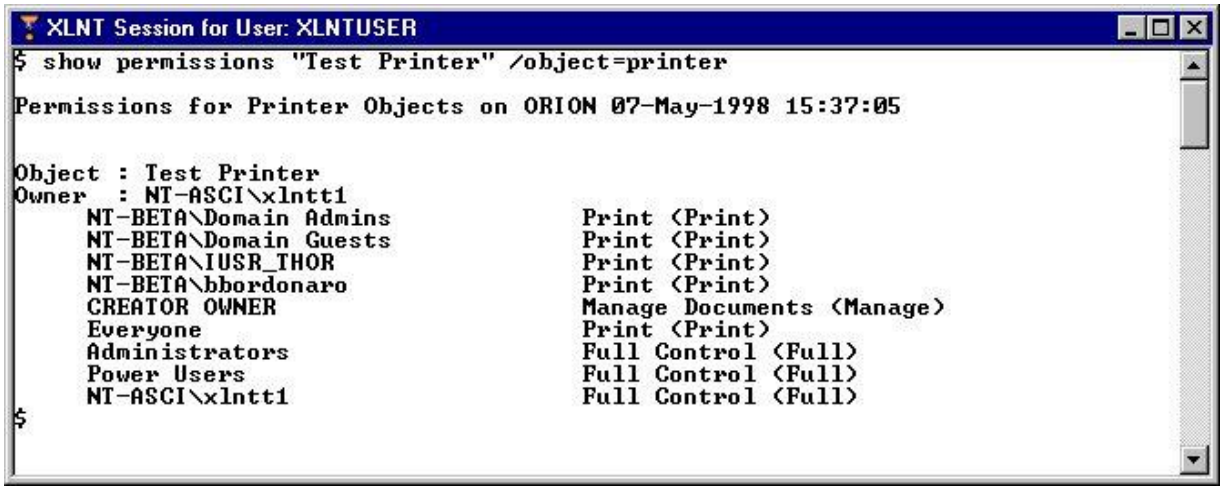
User Account from MY-DOMAIN
User Name = TEST
Full Name = John J. User
Comment =
Country Code = 0
Account Active = Yes
Account Locked = No
Account Expires = Never
Password Last Set = 7/22/2002 12:10:50 PM
Password Expires = N/A
Password Changed = 7/22/2002 12:10:50 PM
Password Required = Yes
User may change password = yes
Workstations Allowed = All
Home Directory = c:\test
Profile Path =
Logon Script =
Last Logon = 2/17/2006 1:42:40 PM
Logon Error Count = 0
Logon Success Count = 0

```
$ security show user testuser2/domain/full
Windows NT 5.1 Security information for Picasso  on 2/17/2006 1:43:19 PM

User Account from
User Name = TEST
Full Name = Test
Comment = ASCI - TEST - Test(No Mailbox)
Country Code = 0
Account Enabled = Yes
Account Locked = No
Account Expires = Never
Password Last Set = 7/22/2002 12:10:50 PM
Password Changed = 7/22/2002 12:10:50 PM
Password Expires = Never
Password Required = Yes
User may change password = Yes
Workstations Allowed = All
Home Directory =
Home Directory Drive =
Profile Path =
Logon Script =
Logon Server = Any Logon Server
Last Logon = 2/17/2006 1:42:40 PM
Last Logoff = Never
Logon Error Count = 0
Logon Success Count = 65535
Logon Hours Allowed = ALL
RAS Dialing Privilege = NO
Primary Global Group = Domain Users
Local Groups = None
Global Groups = Domain Users, Domain Admins
TEST has the following rights
        -None

The following Global groups have rights:

Domain Users has the following rights
        -None

Domain Admins has the following rights
        -None
```

Object Security

Control Access to Windows securable objects:

- Files
- Shares
- Registry Keys
- Printers
- Services



SET PERMISSIONS Command

Allows object ownership and permissions to be granted or revoked for any securable object.

```
$ set permissions c:\test /account=jjones:full:full
$ set permissions/revoke c:\test /account=everyone
$ set permissions/object=printer \\server\printer17 -
        /account=(administrators:full, everyone:print)
$ set permissions/object=regkey
\\server\HKLM\Testkey\Test
          /account=(customers:read, everyone:noaccess)
```

SET PERMISSIONS on Cluster

Allows object permissions to be changed based on a textual SID.

$ set permissions c:\test /account=(S-1-1-1-0:full)

This is especially important for Cluster operations since today the resources must be failed over to set proper user/group trustees. XLNT avoids this requirement!

SHOW PERMISSIONS

Displays permissions currently set on the designated object

$ show permissions/object=printer Printer17
Permissions for Printer Objects on ABC 3-Jun-1999 12:43:02
Object: Printer17
Owner: Administrators

CREATOR OWNER	Manage Documents (Manage)
Everyone	Print (Print)
Administrators	Full Control (Full)
Power Users	Full Control (Full)

Service Management

Control and Maintain Windows Services:

- INSTALL SERVICE
- START SERVICE
- SHOW SERVICE
- CONFIGURE SERVICE
- PAUSE SERVICE
- RESET SERVICE
- RESUME SERVICE
- STOP SERVICE
- REMOVE SERVICE

Sample XLNT Application

- Windows Desktop Logon
  - Use XLNT to create a global logon script for all workstation users
  - Map an XLNT procedure to an executable image
  - Allows someone to track all workstation logons for a domain
- The following is a Logon Script using XLNT

Logon Script

```
$ if f$userinfo
   ($username,,,"IFMEMBER","PAYROLL")
$ then
$        net use o: \\server\payrollshare
$ endif
$ exit
```

XLNT and ActiveX Scripting

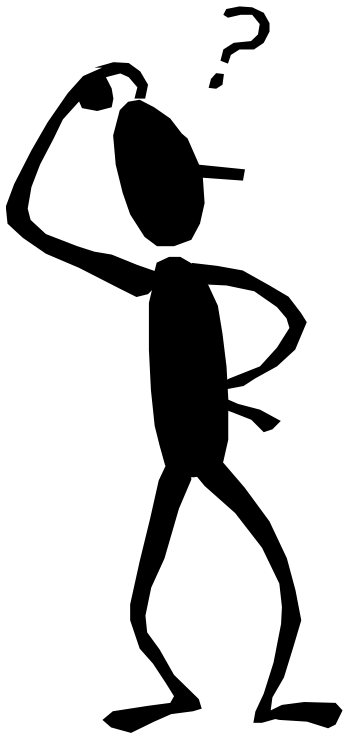
- Unique ability to combine commands and ActiveX object manipulation
- Two procedures on Web Site:
  - Populate Excel spreadsheet from SAM
  - Populate SAM from Excel spreadsheet
- Exchange Scripting Agent Support

XLNT - Product Editions

- XLNT Professional Edition
  - IDE Script Editor and Debugger
  - Script EXE Generator
- XLNT Standard Edition
- XLNT Enterprise Run-Time Edition
  - Requires Professional Edition
  - Supports .EXE Scripts Only

Advanced Scripting and Command Language
XLNT
Windows

Questions



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