

What's New In PxPlus

PxPlus 2016 (v13)



Major Topics

- New user interfaces
- WindX security improvements
- Inter process communications within Windows
- File system changes
- General language enhancements



New User Interfaces

What changed in terms of Visual capabilities?



New User Interfaces

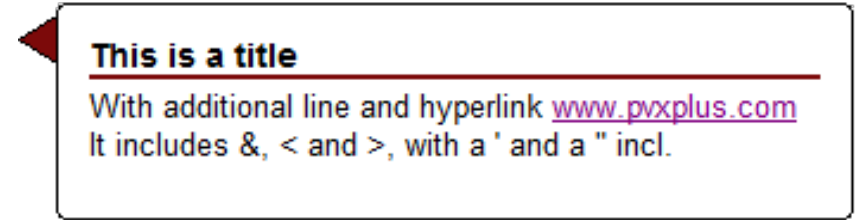
- Enhanced tips
- Dynamic system menus
- Custom MSGBOX buttons
- List View control improvements

PxPlus 2014 FP1



Enhanced Tips

- New look enhanced tips
 - Allows Full HTML within tip
 - Floats to the side of control
 - Supported in iNomads
 - Maybe modified by user
 - Custom color using 'OPTION'("TipArrowColor", xxx)
 - Color change effects arrow head and underline



Enhanced Tips

- HTML based TIP contents
 - Identified with first character being a <
 - May contain full HTML or just sections
 - <h1> tag used to define header line(s)
 - References to <http://localfile/filename> can be used for 'local' files
 - Will be adjusted based on prefix rules etc.
 - <!--html=<http://sample.com/xxx>--> will load specified URL
 - All hyper links will be forced to external browser
 - System will insert **target="blank"**



Enhanced Tips

● Text based TIP contents

- To use extended Tip format, start/end first line with asterisk and set system parameter **'TC' = -2** *(default)*
 - First line will be treated as Header line
 - Multiple lines separated by \$0A\$ or SEP
 - Embedded hyper links allowed using
- Standard text format used if first line does not start/end with asterisks or 'TC' not = -2
 - System will BOLD first line, if enclosed in asterisks



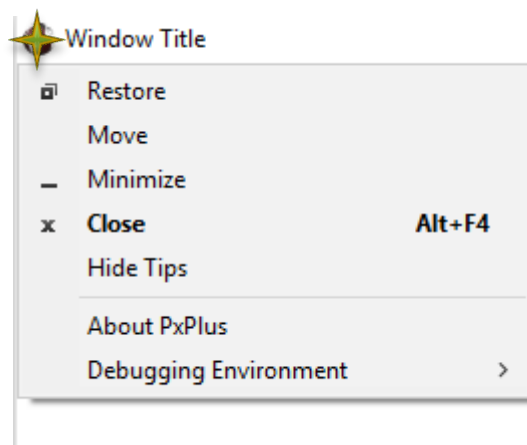
Enhanced Tips

- Using enhanced tips in our demo application
 - Simple description of field contents
 - Display of image for related item
 - Display of web pages (map)



Dynamic System Menus

- What is the System Menu?
 - System menu is menu shown in response to clicking in top left corner of window or pressing ALT-SPACE



Dynamic System Menus

- INI option available since version 5
 - Limit of ten (10) system menus
 - Setting consists of:
 - `menutext=ctl_value`
 - `menutext` is what is displayed in System menu
 - `ctl_value` is CTL that will be generated when item selected
 - Menu appears on all Dialogue style windows and on main programming window



Dynamic System Menus

- PxPlus 2016 allows setting outside of INI using

```
SETDEV (0) SET "SysMenunn" TO "MenuText=ctl_value"  
PRINT 'OPTION'("SysMenunn", "MenuText=ctl_value")
```

- If 'ⁿⁿ' omitted, system uses first undefined system menu slot.
- Setting Sysmenu to "" removes the menu entry



Dynamic System Menus

- Retrieve existing menu item using the FIN function:
 - $X\$ = \text{FIN}(0, \text{"SysMenu"})$
- Returns "MenuText=ctl_value" for specified entry



Dynamic System Menus

- Typical uses of adding SysMenu is to provide direct access to:
 - The PxPlus customizer
 - *Customizer was added in version 5*
 - Other program utilities such as *htmledit

Planned for 2017



Custom MSGBOX Buttons

PxPlus 2014 FP1

- New options added to MSGBOX directive

MSGBOX “text”, “title”, “BTN1=text, BTN2=text”, Resp\$

- You can define custom text on 1 to 3 buttons
 - BTN1=xxx, BTN2=xxx, BTN3=xxx
 - Return value (**Resp\$**) will return BTN1, BTN2, or BTN3 respectively



Custom MSGBOX Buttons

PxPlus 2014 FP1

- Text value used to define button and may contain:
 - & to indicate single character hot-key
 - Images within curly brackets

e.g. `BTN1={!CheckMark}&Process`

- Typical use is to ask specific questions.



List View Control Improvements

- New properties to control Header colors and font

- 'HdrBackColor\$ Background color
- 'HdrTextColor\$ Text color
- 'HdrFont\$ Font, size to use

Properties
apply to ALL
columns

- Added support for 'AutoColSize property

PxPlus 2014 FP1



WindX Security Improvements

How did we improve system security?



WindX Security Improvements

- Host access authorization
 - URL access security enhancements
 - Access controls by function
- Support of SSH connection
- Mitigation of “Denial of Service” attacks
- Improved Get File Box format

PxPlus 2014 FP1



WindX Security Improvements

- WindX provides the server significant access to the user workstation
 - Applications can take advantage of this to improve the end-user experience
- **BUT**, with great power comes potential danger



WindX Security Improvements

- What have we done to minimize risk
 - Provided warnings for ALL windx://server style connections from sites that have not previously been accepted by user
 - Added warning messages whenever a host attempts to access workstation
 - User can suppress messages



WindX Security Improvements

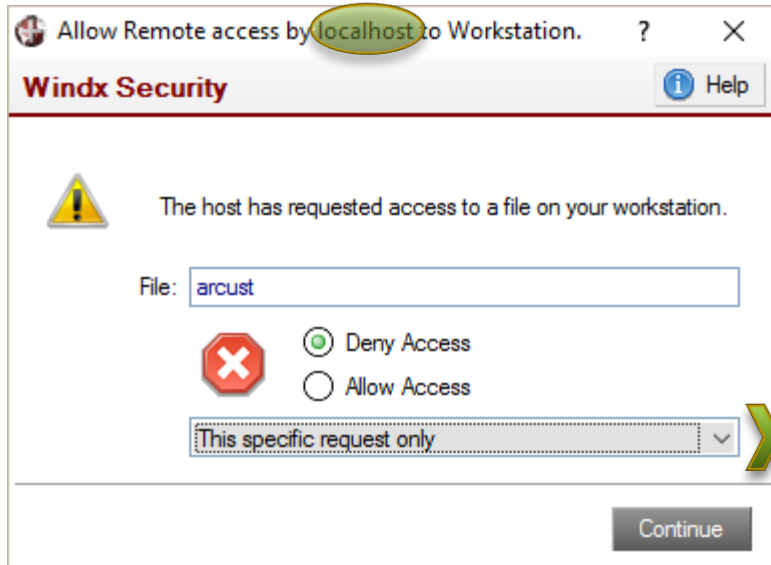
- Conditions flagged and reported to user:

Prompt	Add'l info
The host has requested access to a file on your workstation.	File name
The host wants to create a file on your workstation.	File info
The host would like to delete a file from your workstation.	File name
The host would like to update a file on your workstation.	File name
The host would like to execute application logic on your workstation.	Call/Execute
The host would like to invoke an OS command on your workstation.	Command

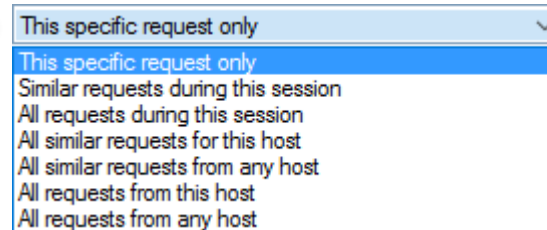


WindX Security Improvements

- Sample warning message sent to user:



Messages are multi-lingual
based on Windows language
(EN, FR, ES, DE, NL)



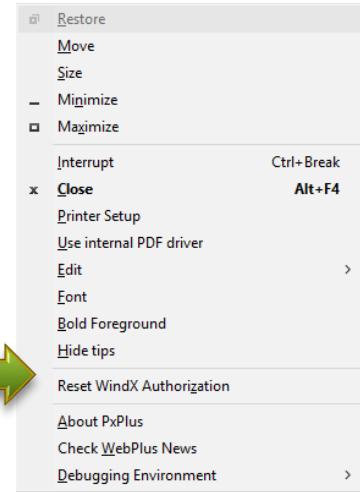
WindX Security Improvements

- Security settings saved on the workstation

- User can reset **ALL** settings by either

- Pressing CTRL-SHIFT-INSERT
 - Pressing ALT-SPACE and selecting from the WindX system menu

Reset WindX Authorization



- This will allow the user to reset all their WindX security settings to their initial value



WindX Security Improvements

- First time WindX is run or security is reset, the user is prompted to either Enable or Disable security



- If Disabled no further warnings will be issued nor will security be checked
 - EXCEPTION new windx://server connections



WindX Security Improvements

- WindX now supports SSH connections
 - Industry standard encrypted TELNET-style interface over TCP/IP
 - Default connection method for terminals to Linux/Unix
 - Provides either userid/password or certificate based login security
 - WindX interface based on PUTTY/PLINK utility
 - PLINK included with WindX plugin and PxPlus for Windows



WindX Security Improvements

- Three methods to invoke SSH connection

- *SSH program:

```
pxplus.exe *ssh -arg host port userid password *
```

- windx:// URL

```
windx://host:ssh:port/args *
```

- WindX connection manager

** port, userid, and password* are optional



Windows Inter Process Communications

How did we enhance the Windows environment?



Windows Inter Process Communications

- Inter-process Pipe data exchange
- READ/WRITE Window data



Inter-process Pipe Data Exchange

- Pipe I/O available since version 5 for Linux/Unix
 - PxPlus 2016 now supports PIPE I/O on Windows
 - Pipe file identified by >, <, or | in first character of file name

OPEN (HFN) "<command"

OPEN (HFN) ">command"

OPEN (HFN) "|command"

Reads output of command

Sends data to command

Allow bi-directional exchange
with command



Inter-process Pipe Data Exchange

- Typical uses for Pipe I/O
 - Use OS commands to return information such as IPCONFIG to get MAC address
 - Run OS Batch commands
 - PxPlus WindX uses Bi-directional pipes to provide SSH using PLINK *(part of putty)*
- Sample application using 'tasklist' command



READ/WRITE Window Data

- Two new directives provide direct data transfers between processes on **SAME** Windows machine

WRITE WINDOW DATA **data\$** TO **handle** WITH CTL **ctlval**
READ WINDOW DATA **data\$** FROM **handle**

Variable	WRITE	READ
data\$	Data being sent	Data Received
handle	Window handle to receive data	Window handle that sent data
ctlval	CTL to be sent along with data	<i>n/a</i>



READ/WRITE Window Data

- Typical “sending” logic:

```
WRITE WINDOW DATA data$ TO handle WITH CTL 1234
```

- Typical “receiving” logic:

```
WHILE 1  
  INPUT (0) *  
  IF CTL = 1234 THEN  
    READ WINDOW DATA data$ FROM handle  
  WEND
```



READ/WRITE Window Data

● Implementation notes:

- No limit to the size of data that can be sent other than available memory
- Target window handle can be either passed in or use FindWindow(“**caption**”) method in *obj/winapi
- CTL should be unique
- Receiving program **MUST** issue a READ WINDOW DATA directive for each CTL event it receives
 - Input queue and READ DATA queue are independant



READ/WRITE Window Data

● Typical Uses

- Communicating with Background process
 - Provides mechanism to queue up requests to long-running background logic
 - Use by systems to log transactions
 - Interfaces to peripherals such as Telephone systems, document printers, etc.
- Common processing logic for CS style implementations
 - For example a Broadcast message routine



File System Changes

What's new in the file system?



File System Changes

- File backup directive
- ZIP file Insert and Extract directives
- SQL data validation
- PDF file UTF-8 support and Watermarks



File Backup Directive

- The Problem:
 - Normal Backup software either requires exclusive use of file or makes a backup of a file that may be in mid-update
- How we solved this:
 - PxPlus 2016 added a high-speed file copy/backup option within PxPlus that defers updates during the process and does not require exclusive access to the file



File Backup Directive

- Syntax:

```
CREATE FILE "new_path" FROM "old_path"  
CREATE FILE "new_path" FROM (channel)
```



File Backup Directive

● Advantages:

- Performs high-speed binary copy of file and contents
- Does not require exclusive access to input file
- Can be used to make copy of **ANY** type of disc file



ZIP Insert and Extract Directives

- New syntax to directly insert or extract file into a ZIP repository

```
EXTRACT FILE filename$ FROM (channel, KEY=name$)  
INSERT FILE filename$ TO (channel, KEY=name$)
```

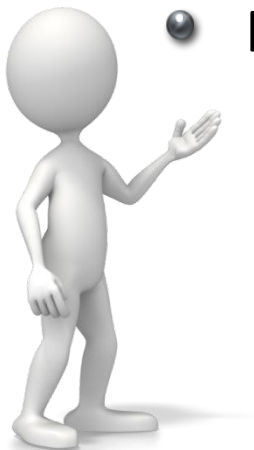
- The key **name\$** is optional. Default uses **filename\$**



ZIP Insert and Extract Directives

● Advantages

- Don't need to read file into memory to transfer
 - Reduces memory usage
 - Avoid OPEN / READ RECORD / CLOSE requirements
- Faster transfer of data



SQL Data Validation

- PxPlus built-in ODBC interface can pre-validate data
 - 3 New INI file options in the [ODBC] section or OPT= string

CHECK_DATES= Y|N

Validates dates
supplied adhere to
DATEFMT= option

CHECK_NUMERICS= Y|N

Validates range and
decimal places on
numeric data

CHECK_LENGTH= Y|N

Validates string lengths
do not exceed field size

- Invalid data generates Error #5 - Data error on device or file
 - MSG(-1) provides additional details



PDF UTF-8 Support & Watermarks

- Built in PDF driver now supports UTF-8 data
 - Controlled by the 'U8' system parameter
 - Allows inclusion of wide variety of characters
 - Font(s) chosen need to include the characters
- New *PDF* option: ***WATERMARK=filename***
 - Adds image in file as background watermark
 - Image is centered and stretched to fit page



General Language Enhancements

But wait, there's more we added!



General Language Enhancements

- Improved JSON, Arrays and IOLIST handling
 - Two new directive to directly move values between associative arrays and IOLISTS

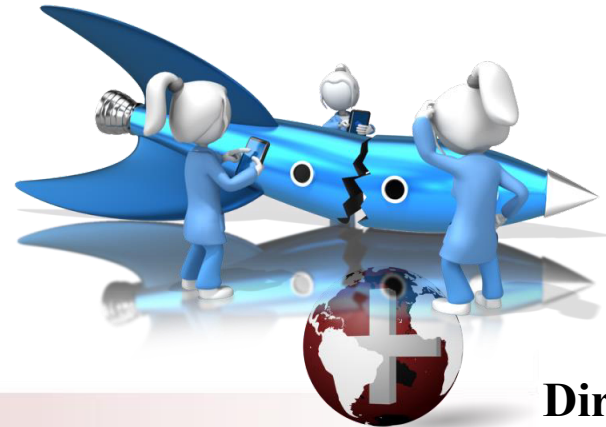
LOAD DATA TO **array\$** ,IOL=**iolist**, REC=**recpfx\$**
LOAD DATA FROM **array\$** ,IOL=**iolist**, REC=**recpfx\$**

- **IOLIST**, if present, controls which variables to transfer
- Simplifies transfer of data between IOLISTS, Arrays, and JSON data



General Language Enhancements

- System failure analysis
 - New LOGFILE dump added to **BOTH** Windows and Linux
 - Outputs key system information when system fails
 - Allows you to help analyze what caused failure
- Many failures occur outside of the control of PxPlus



General Language Enhancements

- Error handling within Objects
- File locking and external Windows functions
 - Added 'XU' parameter to avoid hanging file locks while executing external logic
- Improved memory management on Windows
 - Faster memory allocations/de-allocations
- Now supports [wdx] and [lcl] prefix in PTH() function



General Language Enhancements

- Added built-in CRC32 calculation function
- New command line option *-A:path*
 - Allows for overriding the activation file location
- Recognizes Windows 10 in TCB(25)



Additional Resources

The help link(s) below refer to the current on-line help pages. The functionality may have been further updated since the PxPlus 2016 (version 13) release.

- [PxPlus 2016 Release Notes](#)
- [PxPlus 2016 Update 1 Release Notes](#)

