What's New In PxPlus

PxPlus 2016 (v13)

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Major Topics

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

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New User Interfaces

What changed in terms of Visual capabilities?
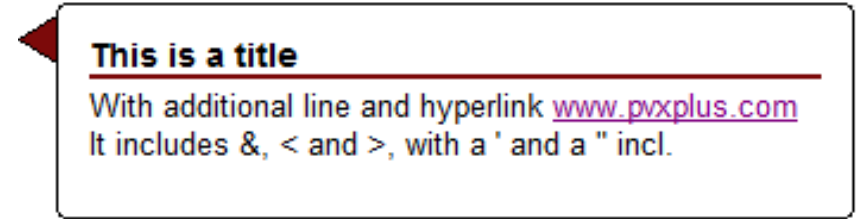
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New User Interfaces

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

PxPlus 2014 FP1

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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

This is a title

With additional line and hyperlink www.pvxplus.com
It includes &, < and >, with a ' and a " incl.

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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 <a href=...>
  - 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
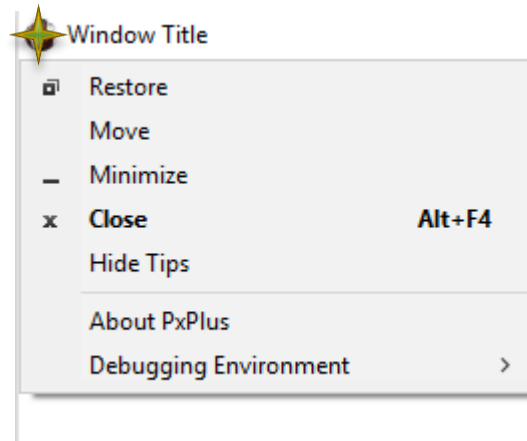
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Enhanced Tips

- Using enhanced tips in our demo application

  - Simple description of field contents

  - Display of image for related item

  - Display of web pages (map)

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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

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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

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Dynamic System Menus

- Retrieve existing menu item using the FIN function:

  - X$ = FIN(0, "SysMenu*nn*")

- 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

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Custom MSGBOX Buttons

- 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

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Custom MSGBOX Buttons

- 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.

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List View Control Improvements

- New properties to control <u>Header</u> 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

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WindX Security Improvements

How did we improve system security?

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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

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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

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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

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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

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WindX Security Improvements

- Sample warning message sent to user:
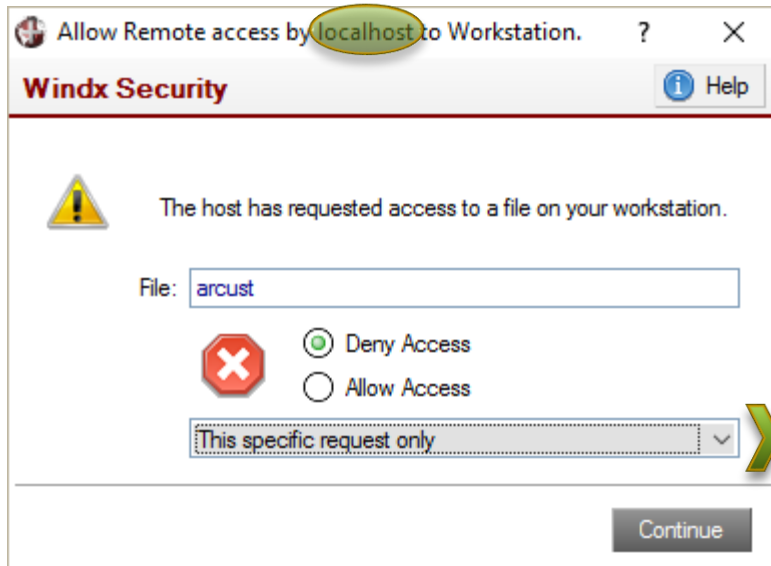
Messages are multi-lingual based on Windows language
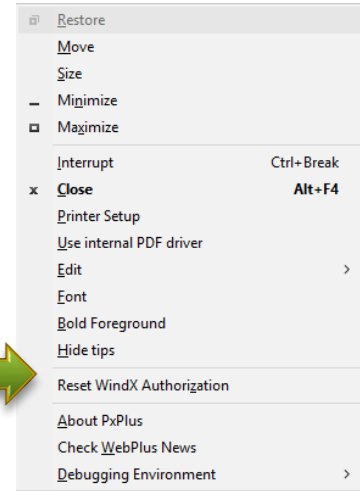(EN, FR, ES, DE, NL)
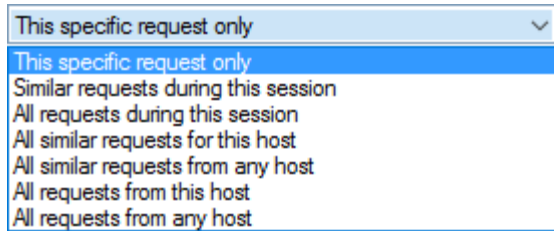
WindX Security Improvements

- 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

Restore		
Move		
Size		
Minimize		
Maximize		
Interrupt		Ctrl+Break
✕ Close		Alt+F4
Printer Setup		
Use internal PDF driver		
Edit		❯
Font		
Bold Foreground		
Hide tips		
Reset WindX Authorization		
About PxPlus		
Check WebPlus News		
Debugging Environment		❯

WindX Security Improvements

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

WindX Security Check

Would you like to enable WindX security?

Without security, malicious sites could access and update the files on your machine or potentially install a virus without your knowledge.

Enabling WindX Security allows you to control what sites can access your system and restrict what they can do.

Enable   Disable

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

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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

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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

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Windows Inter Process Communications

How did we enhance the Windows environment?

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Windows Inter Process Communications

- Inter-process Pipe data exchange

- READ/WRITE Window data

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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"   Reads output of command
OPEN (HFN) ">command"   Sends data to command
OPEN (HFN) "|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

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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	*n/a*

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

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File System Changes

What's new in the file system?

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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

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File Backup Directive

- Syntax:

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

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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

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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	CHECK_NUMERICS= Y|N	CHECK_LENGTH= Y|N
Validates dates supplied adhere to DATEFMT= option	Validates range and decimal places on numeric data	Validates string lengths do not exceed field size

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

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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!

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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

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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

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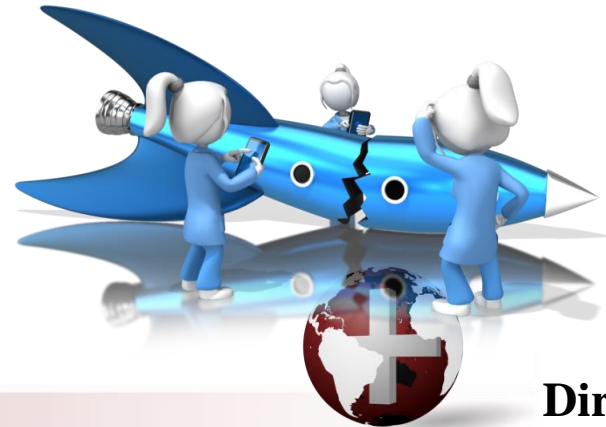
General Language Enhancements

- 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

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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)

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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](#)