

# Core Language Enhancements

PxPlus 2017 (v14) & PxPlus 2018 (v15)

# Core Language Features

- Chromium Browser control for Windows
  - Eliminate dependence on Shell.Explorer and Internet Explorer
  - Avoid Windows updates causing inconsistent results
- If and Jump Tracing
  - Improved tracing capabilities

2017

For more details,  
see the  
Web Browser PDF

2018

For more details,  
see the  
Principals of  
Debugging PDF

# Core Language Features

- Syntax processing
  - Automatic type conversions
- PxPlus 'Link' files
  - **.pxplus** and **.windx** file extensions
- Hyperlinks in PDF files
- New Syntax additions



2017



2018

# Syntax Enhancement

## Auto type conversions

- New parameter 'AC' converts types
  - Conversion done in the compiler
    - Inserts STR ( xxx ) or NUM ( xxx ) as required
    - Maintains compatibility with prior releases

Original entered text	Updated text
amt_due=amt_due+inv_amt\$	amt_due=amt_due+ <b>NUM</b> (inv_amt\$)
error\$="Client owes \$" + amt_due + "."	error\$="Client owes \$" + <b>STR</b> (amt_due) + "."

- Simplifies coding while maintaining compatibility
  - Insertion of functions identifies how code will be executed
- Default is OFF

# PxPlus 'Link' Files

- New Windows file suffix **".pxplus"**
  - Defined during software installation
  - Makes updating software without changing shortcuts easier
  - Simple to create text files
    - Contents consist of:
      - Lead program
      - -ARG values required
    - Runs in the directory the Link is created
    - Uses most recently **'installed'** PxPlus
  - Defaults to minimized (*as of PxPlus 2018*)

# Improved CVS Functions

- New QPRINT format for Quoted Printable
  - Converts non-printable hex codes to =XX
  - Line breaks every 72 columns maximum
  - Commonly used for email transmissions
    - Smaller content size than BASE64
- New HTML format
  - Removes/strips all HTML tags
  - On input, converts &xxx; to proper Unicode/UTF-8
    - Includes over 240 special codes
      - &amp; &copy; &darr; etc...
  - On output converts standard HTML code
    - &, <, >, ", ', plus any non-printable or UNICODE

# Hyperlinks in PDF files

- Added using enhanced 'TEXT' mnemonic

```
PRINT 'TEXT'(x1,y1,x2,y2,"Text to display", "<url>"),
```

- Set Attribute field of 'TEXT' mnemonic to URL surrounded by less than/greater than.
- System will generate Hyperlink in the PDF
  - Link will be underscored and in blue
  - Full region defined for TEXT will be hyperlink

# New Syntax additions

- EXIT WITH expression
  - Alternative to RETURN expression which caused confusion with GOSUB/RETURN stack
- POP \*
  - Removes all entries from FOR/NEXT, GOSUB/RETURN stack
  - Similar to RESET directive
- JUL(*string\$* [ , *format\$* ] )
  - Now allows specification of date format as opposed to only using DAY\_FORMAT setting



# New Syntax additions

- TABLE option in **ALL** file functions
  - Added to READ, WRITE, FIN, FIB, PTH, ...
  - Data Dictionary must have been opened
- SAVE WINDOW TO "*pathname*"
  - Saves current child Window as opposed to top level window

# TCP & SSL/TLS Improvements

2017

- Support for TLS1.2 and certificate validation
  - Options to control use of SSL/TLS protocol
    - Enhance WindX/Thin client security
  - Newer SSL libraries
- SFTP file upload/downloads
  - Similar to FTP but uses SSH for secure transfer
- Self-Signed certificate generator

2018

- SETDEV MERGE for TCP channels now supports client merges
  - Used to only allow merging clients to server

# TLS1.2 and SSL support

- Updated library to latest openssl 1.0.1.g
- Added **Server Name Indication (SNI)** support
  - Allows multiple certificates at one host IP address
  - Needed for most multi-hosted connections
- Added options to force TLS1.2 connection
  - Options available to suppress all other protocols
    - Server can specify minimum TLS level required
  - Works on client or host side of connection

# SSL Certificates

More details at  
Creating & Using  
SSL Certificates  
PDF

- New CERTIFICATES=xxxx option

Option	Description
CERTIFICATES= <u>I</u> GNORE	Don't validate any host certificate (default)
CERTIFICATES= <u>V</u> ALIDATE	Validate certificate contents, expiry date and host name
CERTIFICATES= <u>T</u> RUSTREQD	Validate certificate contents, expiry date, host name and came from TRUSTED source

Only ***first*** letter of option required

- PxPlus 2017 comes with list of trusted sources
  - File ca-bundle.crt in install directory
  - Can/should be updated regularly

# Self Signed Certificate creator

- Service provided by PVX Plus Technologies



**PVX Plus**  
TECHNOLOGIES LTD.

Create Self-Signed SSL Certificate

Country Code (2CH):

Region/State/Prov.:

City/Locale:

Company Name:

Host Address:

Target PEM file path:

- Provided by \*tools/sslcrt program (Text or GUI)
- User prompted for:
  - Country
  - Region/State/Province
  - City/Locale
  - Company Name
  - Host name/address

- Request sent securely to our server
  - Returns properly formatted PEM file
  - 2048 bit key, 10 year expiry date

# 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 2018 (version 15) release.

- [Chromium Browser](#)
- [Windows Debugging](#)
- [Auto Convert Type \('AC'\)](#)
- [PxPlus Link File Extensions](#)
- [CVS\(\) Function](#)
- ['TEXT' Mnemonic](#)
- [EXIT Directive](#)
- [POP Directive](#)
- [JUL\(\) Function](#)
- [SAVE WINDOW Directive](#)
- [SSL/TLS Security Certificates](#)
- [Self Signed Certificate Creator](#)