AVAYA

**Product Bulletin**

**Bulletin Number:** P-2010-0012-Global
**Date:** 22 October 2013

# Enhanced CallPilot Support Utility – AppBuilder Explorer

## REVISION HISTORY

| Date | Revision # | Summary of Changes |
|---|---|---|
| 16 February 2010 | Original bulletin | This is the original publication |
| 22 October 2013 | Rev. 1 | Updated URLs for various web-pages; revised utility version to v3 (required for operation of utility on Windows Vista and later PCs) |

## Introduction

This bulletin introduces the enhanced CallPilot support utility, *Application Builder Explorer*, adding even greater capabilities for use in identifying potential problems with the design and call-flow routing of CallPilot applications such as auto-attendant menus and announcement services. It supplements the NTPs and online help, providing guidance on proper application development and additional information specific to the use of various loop types within a call flow, outlines the potential impacts of infinite loops, provides guidance on the use of the utility, and provides additional guidance for the proper usage of Call Transfer blocks.

This enhanced utility replaces the original version communicated in August 2007 via product bulletin P-2007-0218-Global.

## Application Builder Explorer Utility Details

The CallPilot Application Builder Explorer (ABExplorer) support utility is yet another in the comprehensive suite of supplemental maintenance capabilities for CallPilot. This utility minimizes the amount of time and effort required to identify potential problems with design and call-flow routing of CallPilot applications, specifically identifying applications containing loops. Some infinite loops, if encountered, may negatively impact system operation, or at a minimum be a nuisance to callers resulting in "voice-mail jail" type scenarios.

ABExplorer is non-intrusive and can be safely run on a client PC with connectivity to CallPilot servers running releases 2.02, 2.5, 3.0, 4.0, 5.0, and 5.1.

For complete details, reference Appendix-A.

## Ordering Guidelines and Procedures

No changes to ordering or provisioning occur due to the introduction of this support utility. It is available for download at no additional cost.

## References and Related Documents

For additional information on the use of Application Builder, reference the following NTPs:

CallPilot 5.0/5.1 – NN44200-102 Application Builder Guide.
CallPilot 4.0 and earlier – NTP 555-7101-325 Application Builder Guide

NTP documents are available for download from the Avaya Support Portal website at https://support.avaya.com under Downloads & Documents.

## Obtaining the Utility

Application Builder Explorer Utility (ABExplorer) is available for download from the Enterprise Solutions PEP Library (ESPL) website at https://espl.avaya.com/espl.

Under Multimedia Applications Tools, use PEP ID "ABExplorer_v3"

## Utility usage

For complete details on usage of the Application Builder Explorer Utility (ABExplorer), reference Appendix-A of this document.

# Appendix-A

## Introduction

Application Builder Explorer (ABExplorer) is a utility that enables the CallPilot support person to quickly identify potential service affecting loops within Application Builder (AppBuilder) applications. This document describes:

1. Loops
2. Loop Types
3. Potential Impacts of Loops
4. Using the ABExplorer Utility

### 1. Loops

Loops are a useful mechanism to provide intelligence to interactive applications produced with AppBuilder. Depending on input (either from user or system), application call flow can be looped-back to a previously used block (section) where appropriate.

A loop is a subsection of the design in which output(s) from the subsection connect to input(s) of that same subsection. The simplest AppBuilder example of a loop would be a single block which connects one of its outputs to one of its inputs.

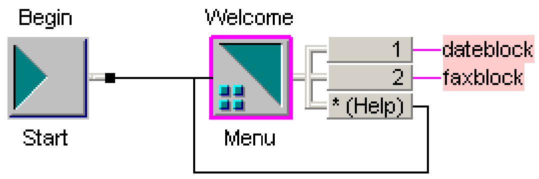
In generic terms the subsection would consist of a series of AppBuilder blocks tied together. An output from this subsection would get looped back to an input of this subsection.

A particular loop may get executed several times during a call, depending on the loop design. A loop has a body and set of boundary conditions. The loop body is executed until the boundary condition is true.

When using this method of designing an AppBuilder application, the designer must follow certain precautions.

The following is an example of a simple loop:

1. Provides "Welcome" announcement to explain options to caller.
2. If caller requires "Welcome" message be repeated (i.e. caller presses asterisk "*" key), returns to step 1. Otherwise, proceeds to step 3 (i.e. caller presses "1" or "2").
3. Proceed to "dateblock" or "faxblock", according to choice of caller.



**Note:** In this example, the loop body is executed until the user selects one of two boundary conditions, dateblock (presses "1") or faxblock (presses "2").

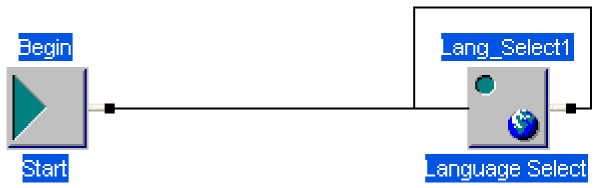
## 2. Loop Types

Loops can be divided into several categories according to their boundary conditions:

1. Contains hard-coded number of iterations. AppBuilder blocks such loops from being created; however, they can be propagated by using the “Copy & Paste” command.
2. Contains undefined number of iterations. In such loops, the boundary condition can be false under some conditions. This category can be further subdivided:
    a. Boundary condition depends on user input.
    b. Boundary condition independent of user input.
3. Contains an infinite loop. Boundary condition is always true preventing the application from exiting the loop.

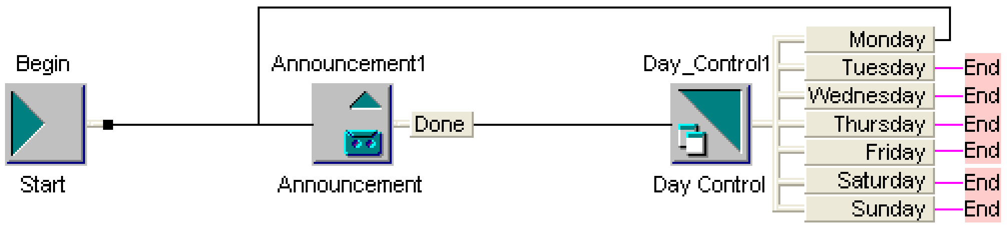
Close attention needs to be placed on the boundary condition when implementing a loop.

The following is an example of a simple “**Infinite**” loop where the application never exits.

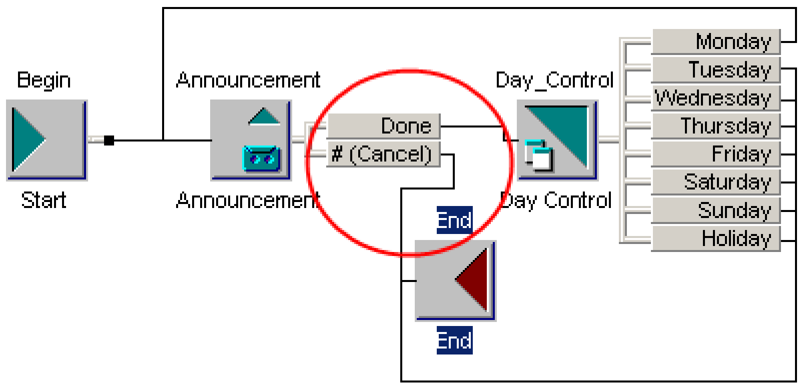


**Note:** Applications containing infinite loops will be terminated or will never exit. It depends on block type that is involved with the loop.

The following is an example poor implementation of loops. While it offers mostly, “**Non-Infinite**” loops (because each has an exit); it acts like an “**Infinite**” loop whenever the day-of-week is Monday.



A better implementation of the above application is shown below. The application was modified by providing an interruption in the loop. The caller can press the octothorpe or pound “#” key to exit the loop (and application) and avoid abnormal termination.



**Important Rule:**
All loops require an exit. Ensuring that all paths through a loop have a way out will protect your application from consuming excessive CPU resources and degrading system performance.

## 3. Potential Impacts of Loops

AppBuilder Application designers must be aware of loops in their design and use these loops responsibly. In this section, we are going to talk about the impacts of loops on the system.

There are two possible scenarios that can result from encountering an infinite loop:

1. **Simple Loop:** Abnormal termination of the application. If the loop is simple (contains only one block), SLEE usually can detect that the application entered an infinite loop and appropriately terminate it.

   This is not a recommended condition and under certain scenarios could impact overall system performance.

2. **Complex Loop:** SLEE can not detect that the application entered an infinite loop and does not attempt to terminate it. Applications of this type can stay trapped in an infinite loop until the next system reboot leading to excessive CPU usage by the SLEE service. CallPilot resources assigned to this call will remain busy and in use long after the originator has left.

   This condition will result in some negative effects:
   - CallPilot will start to answer slowly or not at all. Allocated resources never get released. CallPilot eventually runs out of resources (DSPs, SLEE channels, etc.) resulting in a Ring-No-Answer (RNA) condition.
   - The caller that entered the infinite loop will most likely have not obtained the intended service.

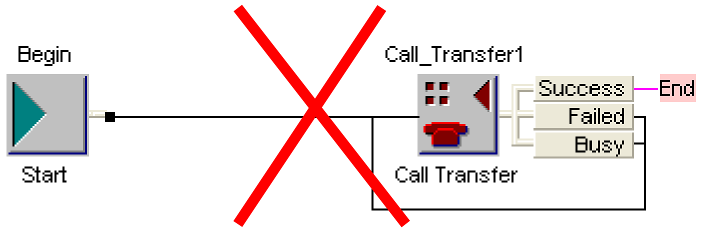
**Important Notes regarding Call Transfer/Thru-Dial Blocks:**

Special attention needs to be paid to loops involving "Call Transfer" and "Thru-Dial" blocks.

**Note #1** - "Call Transfer" and "Thru-Dial" blocks that have "failed" or "busy" outputs that are redirected back into their respective inputs can result in serious call processing issues such as "All Ports Busy" (Ring-No-Answer), and Phantom Calls.

**The use of such loops should be avoided as they have been shown to result in system failure.**

The following example shows a configuration that is prone to causing an infinite loop. When the "Failed" or "Busy" conditions exist, the block will infinitely loop, continuously attempting to successfully transfer the call. While in this "Failed" or "Busy" condition, excessive system resources can be consumed in trying to establish the transfer. The loop does not depend on user input and thus it will be repeated as fast as system resources allow.



An improvement to this application design would be to add a prompt in the loop path that requires user input. Fewer system resources would then be used since now the system has to wait for a user to press a key. In addition, it would only be an infinite loop for as long as the user decided to remain providing input.

The issue could be completely avoided by changing the design to not contain a loop. For instance a “Failed” or “Busy” condition could be routed to an attendant.

**Note #2 -** If an AppBuilder application contains a “Call Transfer” block which transfers to a CDN on the same CallPilot system, the following problem scenario can take place:

CallPilot stops answering with Event ID 36894; DSO and DSP ports are mostly idle but showing some port activity on both; Blue-Call-Router (BCR) is in infinite loop requesting IVR treatment for non-existent calls; and resulting Ring-No-Answer may occur.

**CallTransfer blocks should not be used for transferring to CDNs.**

To avoid this problem scenario, one of the following options can be used:

1. If CDN refers to a standard system block, it is recommended to include that corresponding system block into the application. For example Express Fax Messaging, Multimedia Messaging, etc.
2. If a CDN refers to another application, it is recommended to include that application using the import/export application functionality.
3. If CDN refers to the same application, the output should be redirected to the beginning of the application, i.e. the first block after the “Begin” block.

## 4. Using the ABExplorer Utility

ABExplorer is a diagnostic tool that allows Avaya and Channel Partner technical support personnel perform basic analysis on AppBuilder applications. The utility scans the entire suite of AppBuilder applications for loops by parsing source files (.ED) for the following information:

1. Blocks (e.g. Call Transfer, Thru-dial, etc.) that loop back onto themselves. All AppBuilder block types can be configured as search parameters.
2. Version of AppBuilder Editor and SNT compiler used to create an application.
3. Voice and Fax Items within the applications.

**Note:** The utility is intended for use by qualified/trained technical support teams.

## Using ABExplorer: Step-by-Step

Due to high amounts of disk activity and possible contention between ABExplorer and the AppBuilder Editor, this utility can not be executed on a CallPilot server. Instead, it must be executed from a client PC. The utility contains guardrails to prevent running it on the server. If attempted, a dialog box appears with the following message "Cannot run ABExplorer on a CallPilot server Quitting.".

**Note:** If you are using ABExplorer on Windows Vista or newer, you should launch it as Administrator the first time you run the utility. To do this, right-click on the ABExplorer.exe icon, select "Run as administrator". If you move the ABExplorer utility to another folder on the same workstation, you will need to repeat this "Run as administrator" step. Once completed once, the utility can be used normally.

To start analysis in ABExplorer:

1. Copy ABExplorer to a folder on a non-CallPilot workstation (Windows platform).

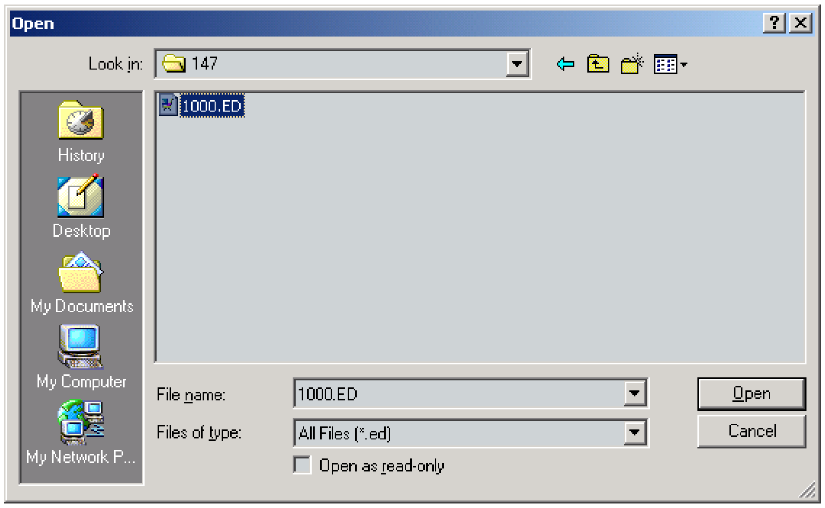
2. Copy the AppBuilder applications from the CallPilot server to a workstation folder named "uprog" where the ABExplorer utility is installed. AppBuilder applications are stored on the CallPilot server in the locations note below. Larger systems may contain multiple "uprog" folders, located in D:\, E:\, and F:\ drives:

    - D:\Nortel\cust\cust1\nm_abd\uprog\
    - E:\Nortel\cust\cust1\nm_abd\uprog\ (for multi-volume servers)
    - F:\Nortel\cust\cust1\nm_abd\uprog\ (for multi-volume servers)

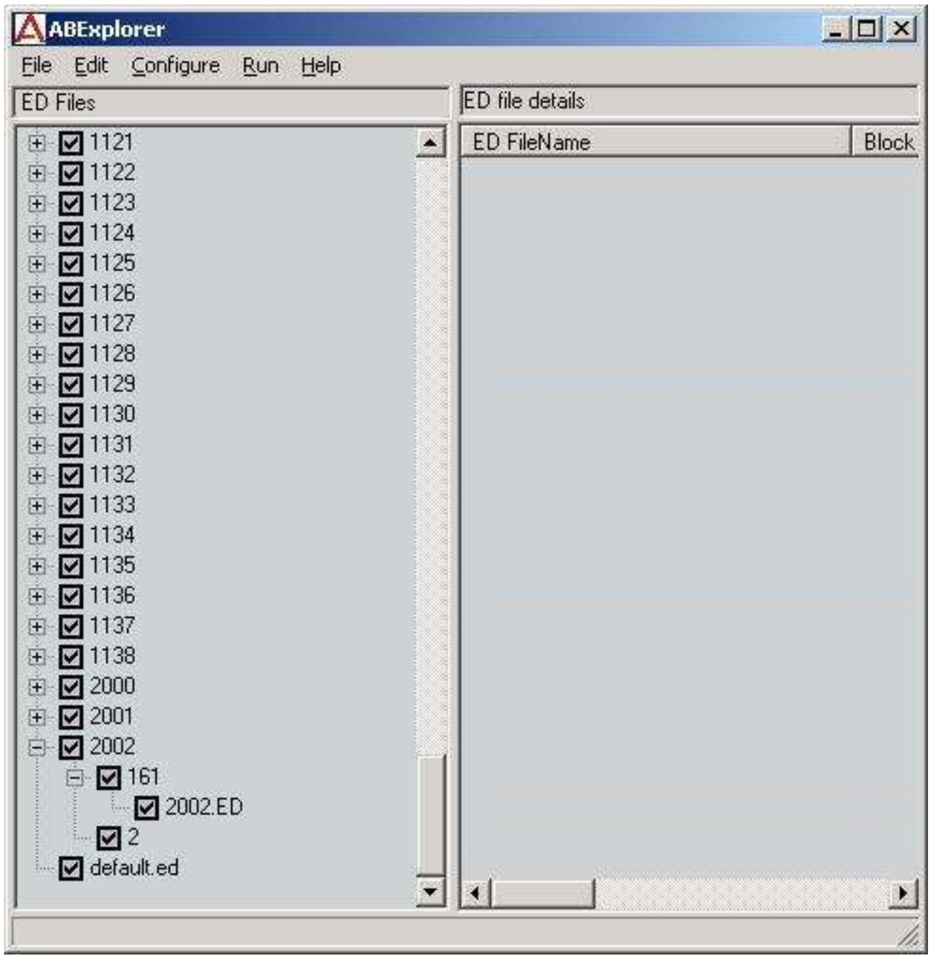
    Example of copying applications to a local folder D:\Temp\uprog (path layout):

    - D:\Temp\uprog\1000\1\1000.ED
    - D:\Temp\uprog\1000\1\1000.RUN
    - D:\Temp\uprog\1000\2\1000.ED
    - D:\Temp\uprog\1000\2\1000.RUN
    - D:\Temp\uprog\1001\147\1001.ED
    - D:\Temp\uprog\1001\147\1001.RUN

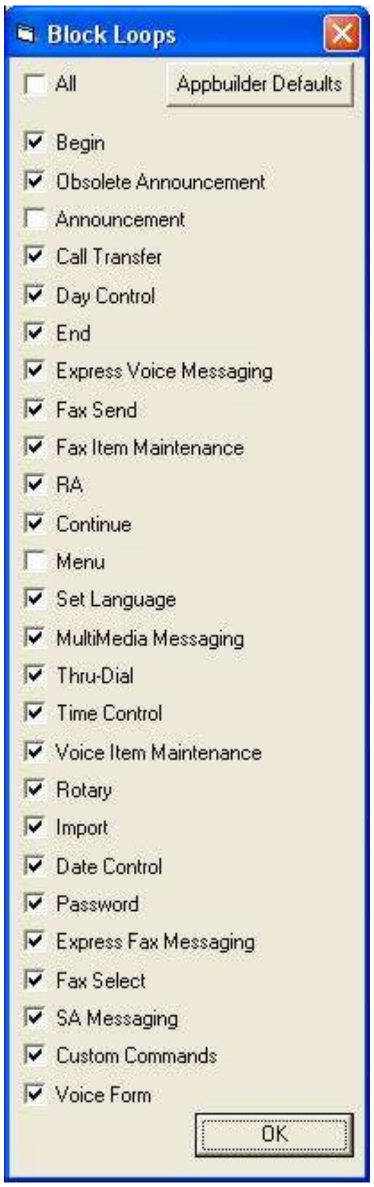
3. Launch ABExplorer and select **File** > **Open**. Use the File/Open dialog to locate a single .ED file within the AppBuilder applications and click **OK**.



4. ABExplorer will locate the uprog folder as the starting location for including applications. The Application IDs (AppIDs) will appear in the left window pane. Select specific AppIDs for analysis.



5. From the **Configure** Menu, select "**Block Loops**". The following analysis options are available:


Block Loops

[ ] All — Appbuilder Defaults

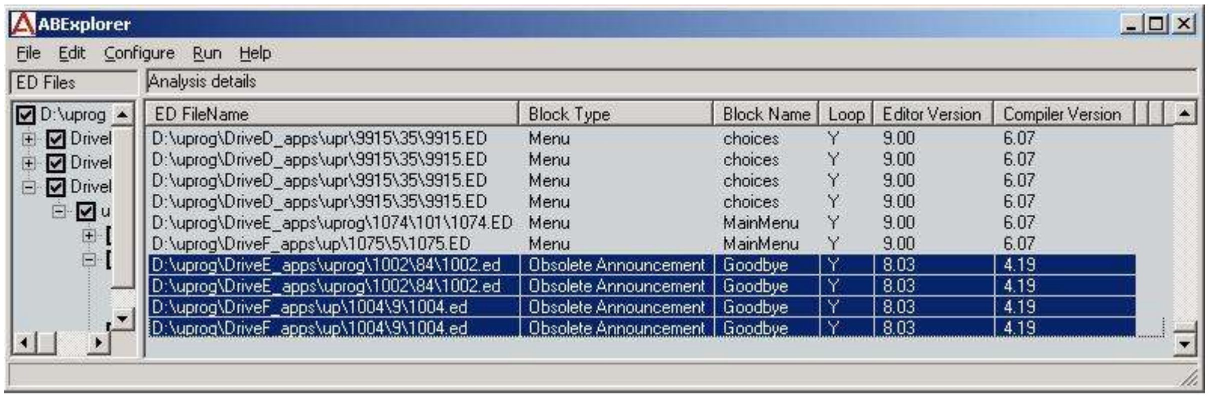
[✓] Begin
[✓] Obsolete Announcement
[ ] Announcement
[✓] Call Transfer
[✓] Day Control
[✓] End
[✓] Express Voice Messaging
[✓] Fax Send
[✓] Fax Item Maintenance
[✓] RA
[✓] Continue
[ ] Menu
[✓] Set Language
[✓] MultiMedia Messaging
[✓] Thru-Dial
[✓] Time Control
[✓] Voice Item Maintenance
[✓] Rotary
[✓] Import
[✓] Date Control
[✓] Password
[✓] Express Fax Messaging
[✓] Fax Select
[✓] SA Messaging
[✓] Custom Commands
[✓] Voice Form

The above dialog box is used to select which AppBuilder application blocks are to be included in the loop search. Click the "**AppBuilder Defaults**" button to set to default configuration. This will search all blocks for loops except for "Announcement" and "Menu" blocks which can naturally be looped back onto their selves.

The "**All**" checkbox will toggle all or none of the AppBuilder blocks.

The “**Obsolete Announcement**” checkbox is for a special block that can be searched for. There are no known issues with having this block type. To simplify trouble-shooting efforts, applications with this block type should be opened and saved with the AppBuilder editor to bring the block up to the latest version. To ensure that this change is saved, it may be necessary to move a block in the design (and then move it back to its original position) to signal to AppBuilder that a change has been made.

Example:
The highlighted lines in the following ABExplorer screenshot have detected application 1002 and 1004 using an old announcement block interface. Likewise, the version information used to create these applications is 8.03 for the AB Editor and 4.19 for the SNT compiler. It's advisable to update these older applications to current versions by opening and then saving the applications within AppBuilder.



| ED FileName | Block Type | Block Name | Loop | Editor Version | Compiler Version |
|---|---|---|---|---|---|
| D:\uprog\DriveD_apps\upr\9915\35\9915.ED | Menu | choices | Y | 9.00 | 6.07 |
| D:\uprog\DriveD_apps\upr\9915\35\9915.ED | Menu | choices | Y | 9.00 | 6.07 |
| D:\uprog\DriveD_apps\upr\9915\35\9915.ED | Menu | choices | Y | 9.00 | 6.07 |
| D:\uprog\DriveD_apps\upr\9915\35\9915.ED | Menu | choices | Y | 9.00 | 6.07 |
| D:\uprog\DriveE_apps\uprog\1074\101\1074.ED | Menu | MainMenu | Y | 9.00 | 6.07 |
| D:\uprog\DriveF_apps\up\1075\5\1075.ED | Menu | MainMenu | Y | 9.00 | 6.07 |
| D:\uprog\DriveE_apps\uprog\1002\84\1002.ed | Obsolete Announcement | Goodbye | Y | 8.03 | 4.19 |
| D:\uprog\DriveE_apps\uprog\1002\84\1002.ed | Obsolete Announcement | Goodbye | Y | 8.03 | 4.19 |
| D:\uprog\DriveF_apps\up\1004\9\1004.ed | Obsolete Announcement | Goodbye | Y | 8.03 | 4.19 |
| D:\uprog\DriveF_apps\up\1004\9\1004.ed | Obsolete Announcement | Goodbye | Y | 8.03 | 4.19 |

**ABExplorer has detected obsolete announcement blocks.**

**Version Info:**
ABExplorer displays the version number for the AppBuilder editor GUI and underlying compiler used to create the application. These version numbers are used by CallPilot designers to help to determine whether a change to the AppBuilder block interface is associated with any customer issue. As of CallPilot 2.02/Service Update 4 (SU04), the editor version is 9.01 and the compiler version is 8.03. There are no reported issues with having older AppBuilder application versions, but this feature is included for trouble-shooting purposes.

Background:
SNT (Show-N-Tell): The IVR application creator. It consists of an editor and underlying functional blocks (i.e. Call Transfer, Menu, Password Check, etc.). SNT is used by both the Avaya CallPilot Telset Applications designers to create "canned applications" (Voice Messaging, Speech-Activated Messaging (SAM), etc.) and CallPilot administrators (Channel Partners and End-users/Customers, to create custom AppBuilder applications).

When the SNT editor or underlying functional blocks are changed, incompatibilities may occur. Two versions used to track these differences:

1. AB Editor – Application Builder application version.
2. SNT Compiler – Canned applications file versions.

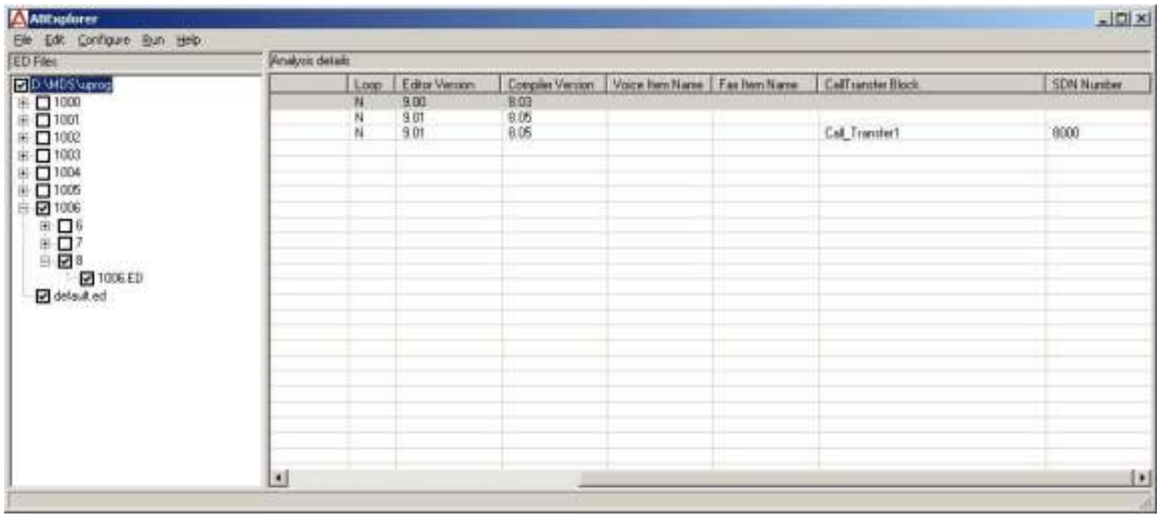
The following is a cross reference list of the CallPilot server software release version, AppBuilder Editor version, and SNT version.

| CallPilot Server version | AB Editor | SNT version |
|---|---|---|
| 1.05 | 9.0 | 5.06 |
| 1.06 | 9.0 | 5.06 |
| 1.07 | 9.0 | 6.07 |
| 2.01.26/2.01.27 | 9.01 | 8.03 |
| 2.5 | 9.01 | 8.03 |
| 3.0 | 9.01 | 8.03 |
| 4.0 | 9.01 | 8.03 |
| 5.0/5.1 | 9.01 | 8.05 |

**Voice Items**:
This option lists all voice items defined within an application. This feature is useful for tracing the same prompt defined in separate applications, and also provides a way to gauge voice item usage.

**Fax Items**:
As with voice items, this option lists all fax items defined within an application. This feature is useful for tracing the same fax defined in separate applications. It will also help gauge fax item usage.

**Call Transfer blocks:**
ABExplorer_v2 detects Call Transfer blocks which are transfers to CallPilot CDNs. A critical situation may occur when a Call Transfer block calls another CallPilot CDN. This added functionality detects these Call Transfer loops quickly and easily.



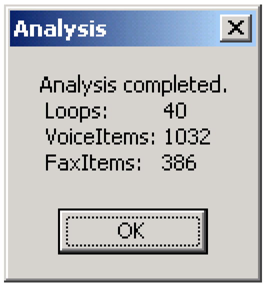
| | Loop | Editor Version | Compiler Version | Voice Item Name | Fax Item Name | CallTransfer Block | SDN Number |
|---|---|---|---|---|---|---|---|
| | N | 9.00 | 8.03 | | | | |
| | N | 9.01 | 8.05 | | | | |
| | N | 9.01 | 8.05 | | | Call_Transfer1 | 8000 |

6. After configuring ABExplorer, the analysis can be started by selecting Menu option **Run->Start Analysis**

   ABExplorer analysis details are displayed within the listview pane. The following information is listed:

| Heading | Description |
|---|---|
| EDFileName | Used to determine AppID and version information |
| BlockType | Type of AppBuilder block |
| BlockName | Name of Block within AppBuilder |
| Loop | True (Y) if loop found on a particular Block |
| EditorVersion | Version of AppBuilder editor |
| CompilerVersion | Compiler version of SNT compiler |
| Voice Item Name | Name of Voice item within AppBuilder |
| Fax Item Name | Name of Fax item within AppBuilder |

7. An analysis dialog box will eventually appear with the results.

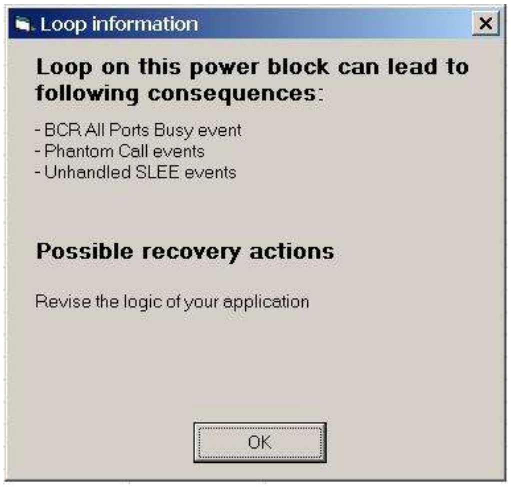


```
Analysis completed.
 Loops:       40
 VoiceItems: 1032
 FaxItems:   386
```

**Supplemental Notes:**

- A text version of results can be copied onto the Windows Clipboard for further analysis by using the **Edit** > **Copy** menu.
- Additional information concerning detected loops, possible negative effects, and recommended solutions can be obtained by double-clicking on the corresponded block.

  For example, for looped Call Transfer block, the following information is displayed:



**Loop on this power block can lead to following consequences:**

- BCR All Ports Busy event
- Phantom Call events
- Unhandled SLEE events

**Possible recovery actions**

Revise the logic of your application