

V3 ApplCore Parameter Checking

Starting with Version 3.08.08

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Overview:

Historically, ApplCore has suffered from crashes (windows exceptions) and other behaviour when incorrect parameter types are specified to certain of the ApplCore commands. This problem has been with us for many years, and a number of bug reports have been submitted calling attention to the problem.

The typical problem is described as in Bug 2207 (TE command wrong variable written).

Changes have been made to effect correction for this ApplCore system-wide problem (incorrectly supplied command parameters causing data corruption).

It was determined that correction of these problems was best addressed by adding a run-time parameter inspection and reporting mechanism to all ApplCore commands. The approach taken resolves the crashing problems in all of the commands which return values in a string or numeric variable.

Improvements in checking of parameters for range errors and for optional parameters are also addressed by these changes.

AppCore Parameter Inspection Specifics:

Starting with V3 AppCore version 3.08.01, run-time parameter inspection has been added to validate the result/output string and numeric variable parameters of the commands listed below in Appendix I.

For example:

"LG" Third Parameter
"LX" Fourth Parameter
"NF" Fourth Parameter
"TL" Second Parameter
"TR" Second Parameter

Previously, when these commands had an incorrectly specified output variable AppCore crashed or overwrote other variables. Now, AppCore detects such problems such as: specifying a numeric literal instead of a numeric variable (or string literal instead of a string variable) and issues a diagnostic "ERROR" message and the AppCore command returns as a NULL function -- rather than producing unpredictable results, such as an over-write of A%, A\$ or other user variables or an AppCore crash (exception).

The parameter inspection scheme also performs such checks as noting that an input parameter is a null string -- where the command expects a string (such as in the RI command). Such occurrences are flagged as a "WARNING". Such warnings do not alter command execution, i.e. command execution continues.

The run-time parameter inspection scheme generates debug stream messages which are logged to the AppCore Debug window and to the DBWIN stream (selectable from the AppCore right-click menu).

The debug messages include message type information ("ERROR" or "WARNING"), line number, command, parameter number and an explanatory text indicating the nature of the detected problem.

The run-time parameter inspection is a very low overhead scheme and should not affect AppCore performance. However, should there be a concern or an issue arise – environment variables have been added to AppCore.ini to control the mechanism.

Starting with V3 AppCore version 3.08.08, run-time parameter range checking is also present.

Range checking includes:

- Workstation numbers: [1..999]
- Device number: [1..999]
- Slot numbers: [14,096]
- Line numbers: [1..32,677]
- Integer memories: [1..10,000]
- Info Driver Indices: [1..4096]
- Router Driver Indices: [1..4096] (Exception for LAWO support limit is: 65535)
- String memories: [1..4,096]
- Maximum number of panels: 64
- Panel height: [1..32,000]
- Panel width: [1..32,000]
- Database numbers: [1..10]
- Maximum panel identifier number: [1..63]
- Maximum string length 256-1 (255 characters + NULL string terminator)

Message Environment Variables:

Two new environment variables have been added to ApplCore.INI file to enable or disable the parameter checking and enable or disable the logging of parameter inspection WARNING and ERROR messages.

Section: [System]

Env. Variable: EnableParameterInspection=1

Env. Variable: EnableParameterInspectMsgs=1

Environment variable "EnableParameterInspection" is set to "1" by default and enables the new command parameter checking feature which outputs parameter checking WARNING and ERROR messages to the debug window (also see DBWIN.exe).

Setting "EnableParameterInspection" to a value of "0" disables parameter checking. Setting "EnableParameterInspection" to a value of "2" enables a command execution halt mechanism. This mechanism halts execution of a command on parameter errors; that is: the command just returns without executing should there be an error in the supplied parameters.

Message Examples:

The following are examples of ApplCore parameter inspection messages. The first is a "WARNING" message, while the next two are "ERROR" messages:

```
TESTTL__106> WARNING: line: 2300, cmd: 'TL' Parameter 2 is NULL.  
: TL 'b-string' 'TESTTL.EXE'  
: TE 'CASE' 0 'b-stringXE'
```

```
<TESTTL__106> ERROR: line: 2300, cmd: 'TE' Parameter 2 is not a STRING variable. Found a numeric literal  
: TL 0 0
```

```
<TESTTL__106> ERROR: line: 2300, cmd: 'TL' Parameter 2 is not a STRING variable. Found a numeric variable
```

Appendix I:

AppCore Commands Returning Results in Vars

The following is a list of commands which have an output result returned in a string variable or a numeric variable.

"DG" Third Parameter (String)
"DS" Second Parameter (Numeric)
"DS" Third Parameter (Numeric)
"DS" Fourth Parameter (Numeric)
"DS" Fifth Parameter (Numeric)
"EN" Fifth Parameter (String)
"KR" Second Parameter (String)
"KR" Third Parameter (Numeric)
"LG" Third Parameter (String)
"LX" Fourth Parameter (String)
"MG" Second Parameter (Numeric)
"ML" Fourth Parameter (Numeric)
"NC" Second Parameter (String)
"NC" Second Parameter (Numeric)
"NF" Fourth Parameter (String)
"NG" Third Parameter (Numeric)
"NL" Second Parameter (Numeric)
"NM" Third Parameter (Numeric)
"NS" Third Parameter (Numeric)
"NT" Second Parameter (Numeric)
"QC" Third Parameter (Numeric)
"QD" First Parameter (Numeric)
"QD" Second Parameter (Numeric)
"QH" Second Parameter (Numeric)

"QP" Second Parameter (Numeric)
"RD" Fourth Parameter (Numeric)
"RI" Fourth Parameter (Numeric)
"RN" Fourth Parameter (String)
"SA" First Parameter (String)
"SD" Third Parameter (String)
"SD" Fourth Parameter (Numeric)
"SD" Fifth Parameter (Numeric)
"SD" Sixth Parameter (Numeric)
"SE" Second Parameter (String)
"SF" Fourth Parameter (Numeric)
"SG" Second Parameter (String)
"SH" Second Parameter (String)
"SI" Fifth Parameter (String)
"SL" Fourth Parameter (String)
"SQ" Third Parameter (Numeric)
"ST" Second Parameter (String)
"ST" Third Parameter (String)
"TB" Third Parameter (String)
"TD" Third Parameter (String)
"TD" Fourth Parameter (String)
"TL" Second Parameter (String)
"TT" Second Parameter (String)
"XD" First Parameter (Numeric)
"XD" Second Parameter (Numeric)
"XD" Third Parameter (Numeric)
"XD" Fourth Parameter (String)
"XD" Fifth Parameter (Numeric)
"XG" Third Parameter (String)

Appendix II:

AppCore Commands with Optional Parameters

The following is a list of commands which have one or more optional parameters which are not currently checked by the parameter inspection scheme:

"EB" FourthParameter
"EM" ThirdParameter
"EM" FourthParameter
"EQ" SecondParameter
"GR" SixthParameter
"GR" SeventhParameter
"GR" EighthParameter
"KR" FourthParameter
"LF" SixthParameter
"LR" SixthParameter
"RC" FourthParameter
"RC" FifthParameter
"RR" SixthParameter
"RR" SeventhParameter
"RR" EighthParameter
"SC" ThirdParameter
"SC" FourthParameter
"SC" FifthParameter
"SC" SixthParameter
"SC" SeventhParameter
"SC" EighthParameter
"XC" FourthParameter
"XR" SixthParameter
"XR" SeventhParameter

V3 ApplCore Parameter Checking document revision history:

- Original edition V3.08.01 dated: 21-February-2012
- Updated for version V3.08.01 ApplCore, dated: 20-August-2012
- Updated for version V3.08.17 ApplCore, dated: 08-January-2013, added env. var. "EnableParameterReturnOnBad".