DELTA

software technology

AMELIO
LOGIC DISCOVERY
FOR ADS

Understanding ADS applications

Developing applications with Delta ADS takes place on a higher abstraction level compared to what is possible in COBOL or PL/I. When such an application must be understood it is not sufficient to analyse all the ADS sources that each only implement a small aspect of the application. The generated code does have all the information but does not have the abstraction level of the ADS sources. Therefore analyses AMELIO Logic Discovery for ADS both the generated code and the ADS sources and presents the results at the same level of abstraction. AMELIO Logic Discovery for ADS facilitates the understanding of ADS applications and provides suggestions for refactoring and clean-up.

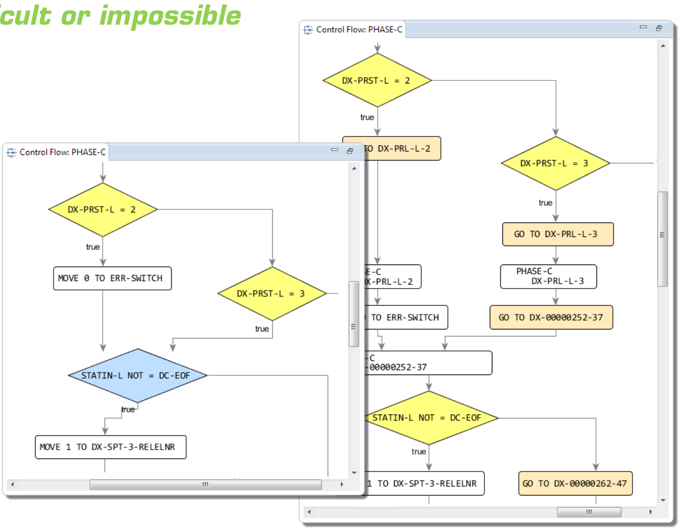
Abstraction with AMELIO Logic Discovery

Fort native COBOL and PL/I the first step for AMELIO Logic Discovery is the analysis which procedures make the application, how their interfaces look like, which procedure calls what other procedure and under which conditions this is done. The procedures that are found, are logically grouped. Variables are examined for their definition, use and scope. For applications that use of files and databases there is an analysis of which procedures do perform read or write access on that data. The longer an application exists the more dead code it tends to have. Therefore AMELIO Logic Discovery determines what data definitions and statements are unused in the application.

AMELIO Logic Discovery has, on top of all of this, a number of specific analyses for Delta ADS.

Recognition of patterns that are difficult or impossible to discover in the generated code

Part of this is the recognition of loops in COBOL. Especially the older variants did not support the concept of loops, therefore Delta ADS has a sophisticated syntax to code complex loops that during the generation process are implemented using GoTo and Labels. AMELIO Logic Discovery for ADS recognizes these loops and presents them as such. The same is the case with switch statements.



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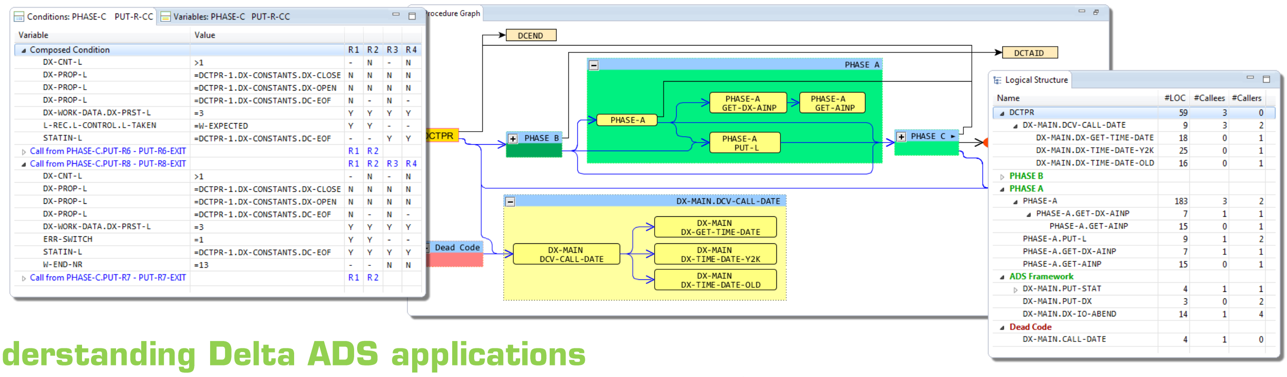
Grouping routines that functionally belong together

The File I/O in Delta ADS is implemented with a number of different routines. They are defined together but, due to the procedural nature of COBOL, their implementation is found in many places throughout the source code. These functions are grouped by AMELIO Logic Discovery and presented together again, even if the original definition was spread over a number of source macros.



Conditions: PHASE-C   PUT-R-CC | Variables: PHASE-C   PUT-R-CC

Variable	Value				
◢ Composed Condition		R1	R2	R3	R4
DX-CNT-L	>1	-	N	-	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DX-CLOSE	N	N	N	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DX-OPEN	N	N	N	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DC-EOF	N	-	N	-
DX-WORK-DATA.DX-PRST-L	=3	Y	Y	Y	Y
L-REC.L-CONTROL.L-TAKEN	=W-EXPECTED	Y	Y	-	-
STATIN-L	=DCTPR-1.DX-CONSTANTS.DC-EOF	-	-	Y	Y
▷ Call from PHASE-C.PUT-R6 - PUT-R6-EXIT		R1	R2		
◢ Call from PHASE-C.PUT-R8 - PUT-R8-EXIT		R1	R2	R3	R4
DX-CNT-L	>1	-	N	-	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DX-CLOSE	N	N	N	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DX-OPEN	N	N	N	N
DX-PROP-L	=DCTPR-1.DX-CONSTANTS.DC-EOF	N	-	N	-
DX-WORK-DATA.DX-PRST-L	=3	Y	Y	Y	Y
ERR-SWITCH	=1	Y	Y	-	-
STATIN-L	=DCTPR-1.DX-CONSTANTS.DC-EOF	Y	Y	Y	Y
W-END-NR	=13	-	-	N	N
▷ Call from PHASE-C.PUT-R7 - PUT-R7-EXIT		R1	R2		

Logical Structure

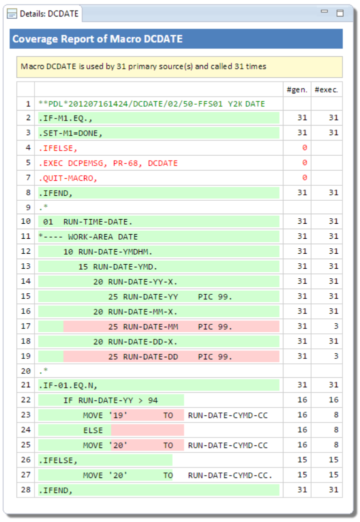
Name	#LOC	#Callees	#Callers
◢ DCTPR	59	3	0
◢ DX-MAIN.DCV-CALL-DATE	9	3	2
DX-MAIN.DX-GET-TIME-DATE	18	0	1
DX-MAIN.DX-TIME-DATE-Y2K	25	0	1
DX-MAIN.DX-TIME-DATE-OLD	16	0	1
▷ PHASE B			
◢ PHASE A			
◢ PHASE-A	183	3	2
◢ PHASE-A.GET-DX-AINP	7	1	1
PHASE-A.GET-AINP	15	0	1
PHASE-A.PUT-L	9	1	2
PHASE-A.GET-DX-AINP	7	1	1
PHASE-A.GET-AINP	15	0	1
◢ ADS Framework			
▷ DX-MAIN.PUT-STAT	4	1	1
DX-MAIN.PUT-DX	3	0	2
DX-MAIN.DX-IO-ABEND	14	1	4
◢ Dead Code			
DX-MAIN.CALL-DATE	4	1	0

Understanding Delta ADS applications

To improve the understanding, maintenance and modernization of Delta ADS applications we have implemented functionality that connects ADS 6 XR and AMELIO Logic Discovery.

ADS 6 XR, the extension of ADS 6 for AMELIO Logic Discovery

ADS 6 XR produces extra information during the generation process that are validated by AMELIO Logic Discovery and used for a number of analyses. Additionally there are reports in ADS 6 XR that show calling hierarchies of generated programs or the use of macros or files. The Post-Generation-Debugger enables the tracing of a single line of code: which source object leads to the production of such a line, what parameters played a role in this and what values did they have at that point during the generation process.



Details: DCDATE

Coverage Report of Macro DCDATE

Macro DCDATE is used by 31 primary source(s) and called 31 times

		#gen.	#exec.
1	**PDL*201207161424/DCDATE/02/50-FFS01 Y2K DATE		
2	.IF-M1.EQ.,	31	31
3	.SET-M1=DONE,	31	31
4	.IFELSE,	0	
5	.EXEC DCPEMSG, PR-68, DCDATE	0	
7	.QUIT-MACRO,	0	
8	.IFEND,	31	31
9	.*		
10	01 RUN-TIME-DATE.	31	31
11	*---- WORK-AREA DATE	31	31
12	10 RUN-DATE-YMDHM.	31	31
13	15 RUN-DATE-YMD.	31	31
14	20 RUN-DATE-YY-X.	31	31
15	25 RUN-DATE-YY PIC 99.	31	31
16	20 RUN-DATE-MM-X.	31	31
17	25 RUN-DATE-MM PIC 99.	31	3
18	20 RUN-DATE-DD-X.	31	31
19	25 RUN-DATE-DD PIC 99.	31	3
20	.*		
21	.IF-01.EQ.N,	31	31
22	IF RUN-DATE-YY > 94	16	16
23	MOVE '19' TO RUN-DATE-CYMD-CC	16	8
24	ELSE	16	8
25	MOVE '20' TO RUN-DATE-CYMD-CC	16	8
26	.IFELSE,	15	15
27	MOVE '20' TO RUN-DATE-CYMD-CC.	15	15
28	.IFEND,	31	31

The Macro-coverage analysis collects information over the use of macros

How many programs make use of a certain macro and what parts of a macro were used how many times? That question is answered by the Macro-coverage analysis. How often a piece of generated code is in fact dead code is also determined.

In this way, AMELIO Logic Discovery delivers suggestions for the refactoring of Macros and assists, with ADS 6 XR, in the understanding of a single Delta ADS Macro.

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AMELIO Logic Discovery

Comprehending COBOL- and PL/I-Applications: Cut costs and risks for maintenance, modernization and re-implementation.

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