T H E P O W E R O F K N O W I N G

RTPA™

Real-Time Program Audit™

TRIPLE ADDED VALUE, CAPABILITY, AND PRODUCTIVITY.

The Real-Time Program Audit (RTPA) is a patented and revolutionary software tool for IBM i information technology and enterprise computing.

RTPA produces real-time analytics and a permanent audit log, including comment line documentation, providing irrefutable answers to what is actually happening inside the computer.

Like a video camera, RTPA records all programs executing inside the computer, including the contents of variables and a timestamp, without human presence or intervention.

RTPA documents source programs to simplify and enhance developer and management understanding, protecting the crucial corporate software asset.

RTPA audits both in-house and vendor-supplied IBM i RPG, COBOL and Control Language Program (CLP) source programs.

RTPA Query provides analytics of executing programs and can sequence all program audit output by the moment-in-time the computer actually executed the statement.

Real-time understanding of your technology and business data, right now.

Unlock the mysteries of the entire crucial corporate software asset to executive management

Simplify and speed information technology development; dramatically reduces effort, time and IT costs

Provide "Just give me the answer, now" real-time focused answers without human research and presence

Protect the company from critical knowledge loss when your best people leave or retire

Enable rapid application development, testing, QA, support, maintenance, auditing and greatly reduce errors

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"I wish IBM would make this product part of the base OS."

3.835 out of 4 — Don Rima, Editor, iSeries Magazine

RTPA™

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BENEFITS

1. Enhanced Productivity and Reduced Operating Costs

RTPA enables **cost savings** by greatly speeding the mastery and utilization of large and complex programs, and reducing programmer orientation and training time. IT developers, QA, testers, and others can expect to **simplify** their jobs and **reduce errors, tripling their capability and productivity**. RTPA eliminates the need for complex coding skills and knowledge of the source program and applications by logging exactly what is executing in the program. Speculation and guess work are eliminated, as is the need to recreate error conditions and the use of developer interactive debugging, all of which cost time and money.

2. Advanced Real-Time Analytics and Insights

RTPA enables unattended real-time source program auditing, recording, and data analytics by providing a video camera like recording of exactly what is happening inside the computer, in real time. The ability to see exactly what is happening inside large and complex source programs reduces stress on developers and executive/IT management, and dramatically increases IT staff and system productivity. RTPA **demystifies complex source code and complex applications** for all who utilize it, in all stages of program development, testing and maintenance.

3. Supports Innovation

RTPA dramatically improves the **speed and quality of programming and DevOps activities** such as program development, testing, QA, as well as related implementation, support, and operations using its unique and patented real-time analytics functionality. This **radically simplifies program development** while reducing or eliminating complex time consuming and now needless work such as using interactive debug and guessing.

4. Positive Customer Experience

An enterprise's customer base will immediately benefit from the use of RTPA **as real-time** system errors and problems can be resolved with **enhanced speed**. RTPA provides **the exact problem issue** audit, and provides for real-time analytics and correction. Developers become smarter and more capable by enabling them to identify and address issues affecting customers in real-time, leading to greater customer satisfaction.

5. Enhanced Security and Enterprise Stability

RTPA creates a **secure recording of all source program output**, providing an **immutable source program activity log**. This security-camera like functionality produces a **backup** of all source program activity, protecting your enterprise from system failures, and providing stability and program-knowledge protection in the case of staff turnover.

Minimum IBM i System Requirements

IBM i Power 5 or later, and appropriate IBM ILE Compilers (RPG, CLP, COBOL)

Approximately 300 million bytes of disk storage

The RTPA licensed software is written in IBM i RPG

Note: RTPA is intended for use in development, testing, pilot production, problem analysis and correction. RTPA is not intended for use in normal production processing.

RTPA 60 Day licensed software Evaluation download for $995

- RTPA licensed program executable software download for RPG, COBOL, CLP and RTPA Query to customer IBM i
- Two interactive GoToMeeting sessions for customer RTPA orientation, training, and education
- Optional GoToMeeting customer IT audit and recommendations by visible experts
- Optional customer in-house education and training via GoToMeeting by visible experts
- Optional RTPA whole product implementation review to improve customer IT environment

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Pricing and Ordering Information

The Real-Time Program Audit (RTPA) is a patented software utility productivity tool. See the www.realtimeprogramaudit.com web site for additional information, pricing, terms and conditions, and to license the Real-Time Program Audit software.

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More information available in the IBM Global Solutions Directory, from "Harkins & Associates, Inc."

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HOW THE REAL-TIME PROGRAM AUDIT (RTPA) WORKS

Select the IBM i RPG, COBOL, or CLP program for RTPA auditing

The IBM i developer enters the RTPA command (**RTPA** for RPG, **RTPACO** for COBOL, or **RTPACL** for CLP programs) to enable the source program with RTPA auditing capability (**Figure 1**).

```
Z$PGM01R          Real-Time Program Audit for RPG (V5R1)        Date:  1/23/18
 PHH                        Select Program to Audit              Time: 13:48:48
                                                                Serial:  1034F0C
 Type choices, press F10.                                        Model:  525
 Input Source Member Name. . . NEWEXPSH       Name, generic*, *ALL, F4=List
   File Name . . . . . . . . .   QRPGLESRC    Name
   Library Name. . . . . . . .   Z$AUDIT      Name

 Object to Library . . . . . . Z$AUDITE       Name
 Create As . . . . . . . . . . *PGM           *PGM, *MOD     Audit comments  Y

 Audit File Outq . . . . . . . *SAME          Name, *SAME    Audit copybooks N

 JOBD for pgm compile libl . . *LIBL          *LIBL, JOBD    Audit Timestamp N
   Library Name. . . . . . . .                Name
                                                             Document Only   N
 Audit Compile Listing Stmts .       to       1-99999
 (Only)                              to                      Audit to Disk   N
                                     to
                                     to
                                     to
 F2=Watch Variables  F3=Exit  F5=Refresh  F6=Auditing Options F7=Compile Options
 F8=Conditional Auditing  F9=Maint. Menu  F10=Submit Exp      F24=More Keys
                                        (C) 2016 Harkins & Associates, Inc.
```

Figure 1 – Select RPG source program NEWEXPSH in file QRPGLESRC in library Z$AUDIT

Press command 10 to submit the program for expansion with RTPA auditing statements

The input RPG source program is compiled (**Figure 2**) and checked for successful compilation, and the RPG input program compile listing is used, with RTPA expansion options, like audit statement comments and timestamp statements, and RTPA audit statements are added to a COPY of the input source program in file QRPGLESRC in library Z$AUDITE.

```
  302     torder = 1500;
  303       iorder = 78.543;
  304    // value of iorder has now been computed
  305         xorder = torder + 13.45  +
  306     // this is a continuation free form statement preceded with +
  307                   26.2 + iorder;
  308      sorder = torder +  xorder +  iorder + rorder + morder + norder;

 K e y   F i e l d   I n f o r m a t i o n
    4  CUSTMAST
         CUSTREC1 is the RPG name of the external format CUSTREC.
                       CUCUST                   PACK       7,0 SIGNED
                       CUSTOR                   PACK       7,0 SIGNED
    2  ORDERDE
         ODETREC
                       ODORD#                   PACK       7,0 SIGNED
                       ODLINE                   PACK       5,0 SIGNED
 Global Field References:
    IORDER             S(8,3)
    TORDER             S(7,0)
    XORDER             S(9,2)

 partial source program compile listing FTPed to Cloud for audit enablement)
```

Figure 2 – Input RPG source program NEWEXPSH compile listing

RPG source statements 302 through 308 are illustrated together with compile listing information

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HOW THE REAL-TIME PROGRAM AUDIT (RTPA) WORKS

The RTPA expanded source program (**Figure 3**) is created in file QRPGLESRC in library Z$AUDITE (developer work library) and the RTPA audit enabled object program is created in library Z$AUDITE (work library), ready for testing.

The RTPA enabled RPG program NEWEXPSH object program is created in library Z$AUDITE.

(Note: RTPA does not change the input source program or the production object program.)

Test RPG expanded source program NEWEXPSH with RTPA audit logging.

Test the RTPA enabled RPG object program NEWEXPSH in library Z$AUDITE.

CALL Z$TEST1N (CLP Z$TEST1N calls RPG object program NEWEXPSH (**Figure 4**).

```
0323.00     torder = 1500;
0324.00                      Z$SRC# =  16   ;
0325.00                      EXSR      Z$GENS;
0326.00                      EXCEPT    Z$00016;
0327.00       iorder = 78.543;
0328.00                      Z$SRC# =  17   ;
0329.00                      EXSR      Z$GENS;
0330.00                      EXCEPT    Z$00017;
0331.00    // value of iorder has now been computed
0332.00                      Z$SRC# =  18   ;
0333.00                      EXSR      Z$GENS;
0334.00         xorder = torder + 13.45  +
0335.00     // this is a continuation free form statement preceded with +
0336.00                    26.2 + iorder;
0337.00                      EXSR      Z$GETI;
0338.00                      EXCEPT    ZF00001;
0339.00      sorder = torder +  xorder +  iorder + rorder + morder +
norder;
0340.00                      Z$SRC# =  19   ;
0341.00                      EXSR      Z$GENS;
0342.00                      EXCEPT    Z$00019;

(partial source program FTPed from Cloud audit enabled for forensic
accounting)
```

Figure 3 – RTPA expanded RPG source program NEWEXPSH with inserted audit statements in blue

```
302     torder = 1500;
          1500
303       iorder = 78.543;
          78.543
304    // value of iorder has now been computed
305         xorder = torder + 13.45  +
           1618.19     1500
306     // this is a continuation free form statement preceded with +
307                    26.2 + iorder;
                              78.543
308      sorder = torder +  xorder +  iorder + rorder + morder + norder;
      93330.496     1500
                             1618.19    78.543
                                               32109.876
                                                         34567.098
                                                                   23456.789

(partial Client Stock Account Summary forensic accounting audit output)
```

Figure 4 – RTPA audit log output of RPG program NEWEXPSH execution with timestamp on right

Every executing RPG source statement is audited with the timestamp, and variable contents (in red).

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