



PROGRESSIVE

Progressive's DB2 Tools and Utilities

Overview

- Challenges and Opportunities
- The Development Framework
- The Tools
 - Call Attach Replacement
 - Thread Cancel Utility
 - DBM1 Storage monitor
 - The Scanner
- Questions

Challenges and Opportunities

- Company growth and increasing software costs
- User submitted work conflicting with warehouse utility jobs
- DBM1 virtual storage constraints
- DB2 lock/ latch issues

The Development Framework

- PROGRAM ARCHITECTURE and SERVICES
 - Parameter Processing
 - Definition
 - Parsing
 - Validation
 - Extraction
 - Console Communications
 - WTO
 - Modify/ Stop
 - Issuing Console Commands

The Development Framework

- PROGRAM ARCHITECTURE and SERVICES
 - Program Loading
 - Stack Processing
 - Dynamic File Allocation
 - Message Processing
 - Definition
 - Parameter Substitution
 - Destination

Call Attach Replacement

The CAF API was written as a replacement for a third party product

```
// TDBA972A JOB (Z00000,N129),'CAF SAMPLE',  
//      CLASS= 7,MSGCLASS= X  
// CAFS      EXEC PGM= DB2PROG  
// SYSOUT   DD SYSOUT= *  
// SYSPRINT DD SYSOUT= *  
// DBAIN DD *  
      PLAN(TSTCP000)
```

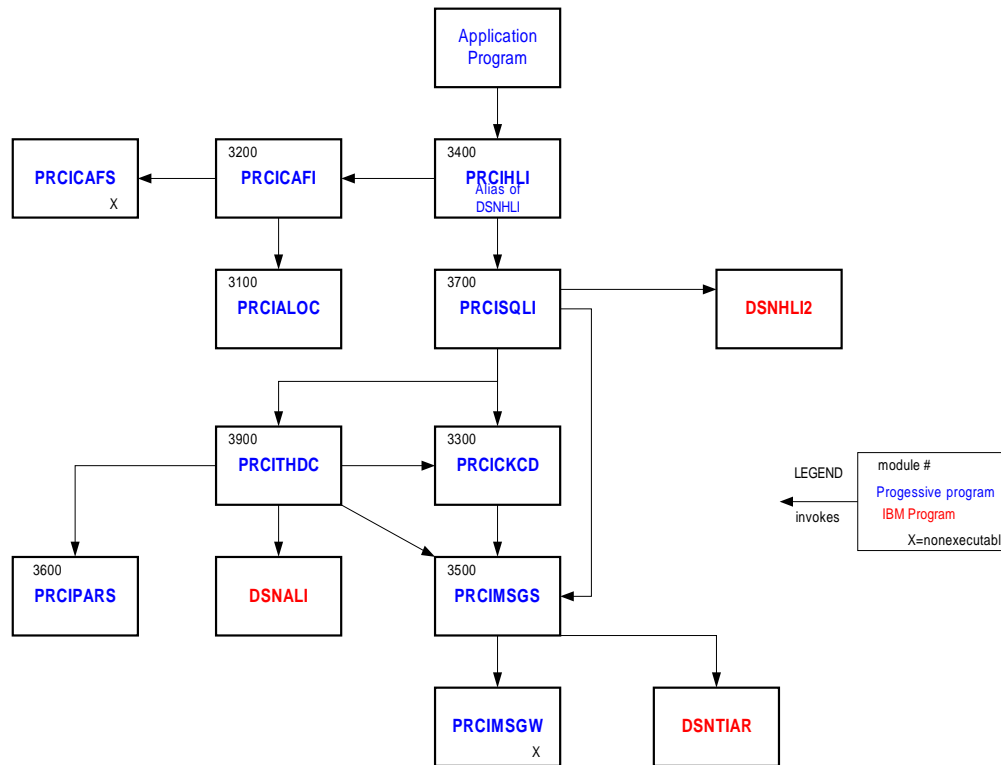
Call Attach Replacement

- CAF SERVICES
 - Dynamic Initialization
 - Hierarchical Selection of Plan and Subsystem
 - Subsystems in Data Sharing Group on Same Lpar Selection
 - 16 choices depending on bits 40 to 43 of TOD - .000255 to .003840 second range
 - SQL Error Logging (not ad nauseam) and Error Translation
 - SVC update of TCBUSER for anchor
 - Wait option for DB2 if not up
 - Terminate option for thread on DB2 Quiesce
 - Abend on Severe Error Option
 - RRS Option
 - Mutli Threads for Mutliple TCB usage

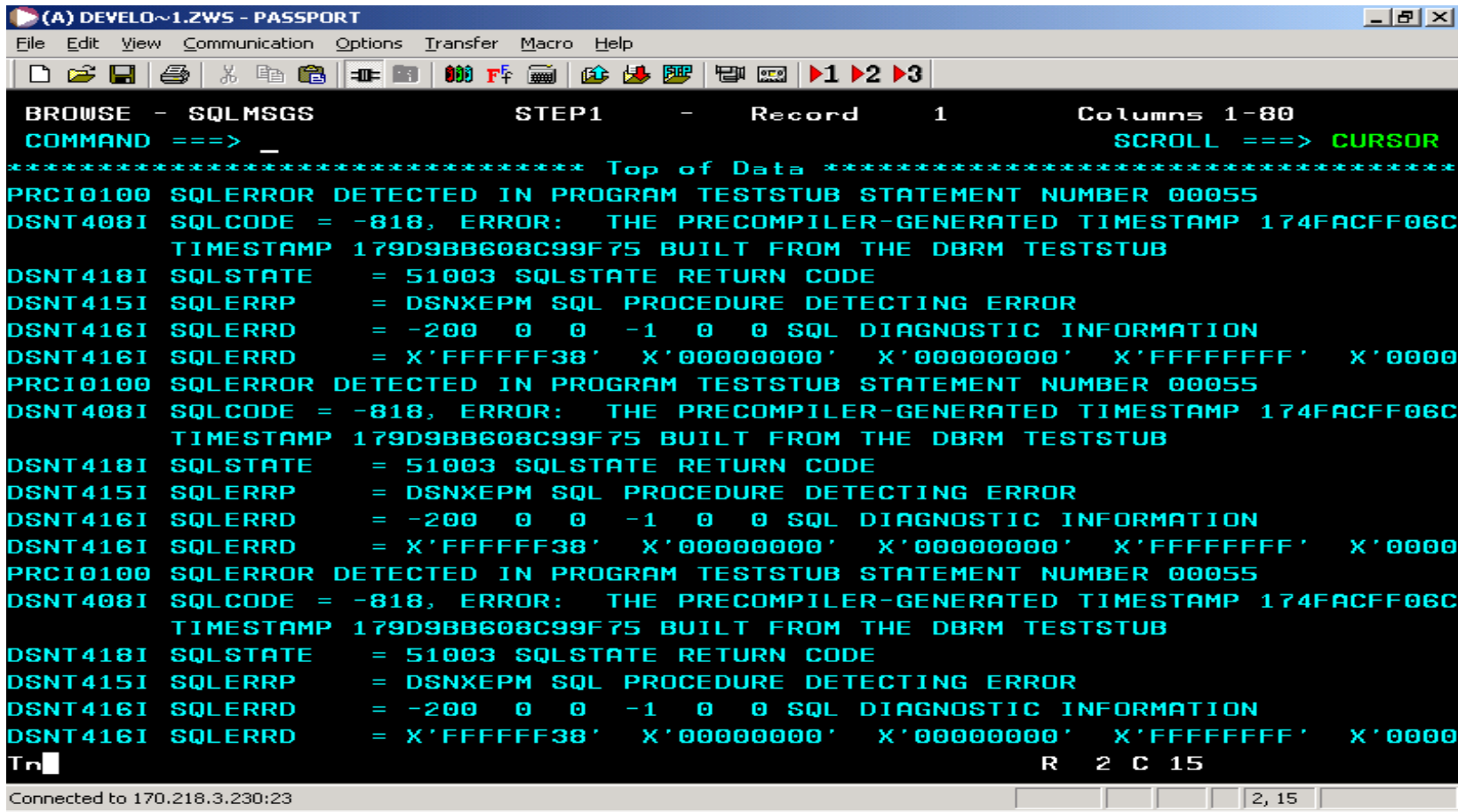
Call Attach Replacement

Progressive Casualty Insurance Corp.
DB2 Call
Attachment
Facility API

Version 1.0.0
10/1/2002



Call Attach Replacement



The screenshot shows a terminal window titled "(A) DEVELO~1.ZWS - PASSPORT". The window contains the following text:

```
BROWSE - SQLMSGs          STEP1 - Record 1          Columns 1-80
COMMAND ==> _              SCROLL ==> CURSOR
***** Top of Data *****
PRCI0100  SQLERROR DETECTED IN PROGRAM TESTSTUB STATEMENT NUMBER 00055
DSNT408I  SQLCODE = -818, ERROR:  THE PRECOMPILER-GENERATED TIMESTAMP 174FACFF06C
          TIMESTAMP 179D9BB608C99F75 BUILT FROM THE DBRM TESTSTUB
DSNT418I  SQLSTATE      = 51003 SQLSTATE RETURN CODE
DSNT415I  SQLERRP       = DSNXEPM SQL PROCEDURE DETECTING ERROR
DSNT416I  SQLERRD       = -200  0  0  -1  0  0 SQL DIAGNOSTIC INFORMATION
DSNT416I  SQLERRD       = X'FFFFFF38' X'00000000' X'00000000' X'FFFFFFF' X'0000
PRCI0100  SQLERROR DETECTED IN PROGRAM TESTSTUB STATEMENT NUMBER 00055
DSNT408I  SQLCODE = -818, ERROR:  THE PRECOMPILER-GENERATED TIMESTAMP 174FACFF06C
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DSNT416I  SQLERRD       = X'FFFFFF38' X'00000000' X'00000000' X'FFFFFFF' X'0000
Trn
R 2 C 15
```

Connected to 170.218.3.230:23

Thread Cancel Utility

- The utility supports thread cancel by tablespace or indexspace

```
CANCEL THREADS FOR TABLESPACE (DB.TS, ...) -  
    SETSTATUS(UTIL), -  
    WAITSTATUS(UTIL), -  
    INCLUDE_USER(PROD* ,TDBA* ,...),-  
    INCLUDE_JOB(P* ...),-  
    EXCLUDE_USER(PROD* ,TDBA* ,...),-  
    EXCLUDE_JOB(P* ...),-  
    DISPLAY
```

Thread Cancel Utility - Features

- Supports CANCEL or REPORT
- Allows QUERY of DB2 locks held by a user or users
- Will issue DB2 commands to set objects in UT status
- Executes DB2 commands to put objects back in RW status
- Will not CANCEL production batch jobs
- DISPLAY option issues display use, locks and claimers

Thread Cancel Utility

```
(A) DEVELO~1.ZWS - PASSPORT
File Edit View Communication Options Transfer Macro Help
[Icons]
BROWSE - SYSPRINT          PRCTTBSF - Record 1      Columns 1-80
COMMAND ==> _              SCROLL ==> CURSOR
***** Top of Data *****
PRCT0006I JOBNAME:  TDBA972A HAS COMPLETED ADDRESS SPACE INITIALIZATION
PRCT0008I PROCESSING PARAMETER FILE DDNAME:  SYSIN
PRCT0009I PARAMETER FILE DDNAME:  SYSIN      INPUT ECHO
REPORT THREADS FOR TABLESPACE( DSQDBDEF.DSQTSDEF )
PRCT0050I PARM FILE PROCESSING COMPLETE
PRCT0208I QUERYING LOCKS FOR TABLESPACE DSQDBDEF.DSQTSDEF
PRCT0209I QUERYING MASS-DELETE LOCKS FOR TABLESPACE DSQDBDEF.DSQTSDEF
PRCT0210I QUERYING LOCKS FOR TABLE TMVS0E5.XYZ
PRCT0211I QUERYING MASS-DELETE LOCKS FOR TABLE TMVS0E5.XYZ
PRCT0210I QUERYING LOCKS FOR TABLE TMVS25F.BIT1982_TESTING_T1
PRCT0211I QUERYING MASS-DELETE LOCKS FOR TABLE TMVS25F.BIT1982_TESTING_T1
PRCT0210I QUERYING LOCKS FOR TABLE TMVSF29.JRNLCNTS
PRCT0211I QUERYING MASS-DELETE LOCKS FOR TABLE TMVSF29.JRNLCNTS
PRCT0210I QUERYING LOCKS FOR TABLE TMVS596.RAYUSERROLE
PRCT0211I QUERYING MASS-DELETE LOCKS FOR TABLE TMVS596.RAYUSERROLE
PRCT0212I QUERYING LOCKS FOR INDEX TMVS596.RAYROLX1
PRCT0210I QUERYING LOCKS FOR TABLE TMVS596.RAYUSER
PRCT0211I QUERYING MASS-DELETE LOCKS FOR TABLE TMVS596.RAYUSER
PRCT0212I QUERYING LOCKS FOR INDEX TMVS596.RAYUSRX1
PRCT0210I QUERYING LOCKS FOR TABLE TMVS596.REP3
Tn
R 2 C 15
Connected to 170.218.3.230:23
NUM 2, 15
```

DBM1 Storage Monitor

- This utility is a more specialized version of the MEMU rexx exec that is available from IBM.

STORAGE INTERVAL(60), -

STORAGE_WARNING(THRESHOLD(84),NODUMP), -

STORAGE_CRITICAL(THRESHOLD(92),NODUMP), -

MAXDBAT(100), -

CTHREAD(120), -

LATCH_RATES(01000, -

01000, -

01000, -

01000, -

01000, -

01000, - . . .

DBM1 Storage Monitor - Features

- Has a warning and critical threshold for DBM1 storage usage
- Checks for CTHREAD and MAXDBAT spikes
- Tracks latch contention rates
- Produces storage profile, similar to the output of the MEMU rexx
- Issues WTOs that are used for email and paging

DBM1 Storage Monitor – What We've Learned

- Large DB2 UTILITY LISTDEFS can consume a lot of DBM1 storage
- Individual queries can use 300M of DBM1 storage
- DB2 Latch contention rates need to be closely monitored
- A small number of CPU intensive queries can consume large amounts of DBM1 storage
- Thread spikes do not necessarily cause storage issues

The SCANNER

- The SCANNER – a generic interval processor

```
SCANDEF DB2_SUBSYSTEM((CONNRETRY_INTVL(60)))
```

```
*
```

```
QUEUE
```

```
  NUM(1),MAXDEPTH(2),TRIGGER(1),TICKER(1),MAXCPU(1),MAXELAPS(70)
```

```
*
```

```
PROCESS NAME(WLM_BOOST) -
```

```
  INIT( -
```

```
    INIT_PGM (PRCSWBSI), SYNTAX(DB9PWBST)), -
```

```
  PROCEDURE( -
```

```
    PROGRAM (PRCSWBST), OPTIONS(RESIDENT)), -
```

```
  INVOCATION( -
```

```
    QUEUE(1),INTERVAL(60),COMMAND(BOOST)) -
```

```
  LIMITS( -
```

```
    MAXCPU(2),MAXELAPS(60))
```

The SCANNER

- SCAN FACILITY
 - Interval Processing with Priority
 - Process Definition
 - Initialization
 - Process
 - Invocation
 - Limits
 - Three Tier MVS Task Structure
 - Main Task - Console Communications
 - Queue Task - Schedule Processes to Queue
 - Process Task - Manage Process Execution

The SCANNER

- SCAN FACILITY
 - Each Queue has its own sysout for reporting
 - Abend Handling
 - Recovery
 - Dump to a Queue Specific Sysout
 - Max Consecutive before disablement
 - RRS Rollback if defined Recoverable
 - Limits
 - Max Elapsed/ Execution
 - Max CPU/ Execution

The SCANNER – Sample Process

- Extract WEBSHERE REPLICATION EVENT PUBLISHER XML from MQ queue and move to a dataset

```
EXTRACTQ QUEUE_MGR(MQB1), -  
    QUEUE(MN.QLOCAL.CMS_MAGNIFY_DATA), -  
    TRANSLATE(TO_EBCDIC), -  
    RESTART_QUEUE(MN.QLOCAL.CMS_MAGNIFY_XTRACT_RESTART), -  
    COMMIT_COUNT(100), -  
    DSN(TDBA003.TEST.EXTRACT(DDNAME(MAGEXTRD))), -  
    NEW,UNIT(SYSALLDA), -  
    DCB(RECFM(VB),LRECL(19000),BLKSIZE(19004),BUFNO(6)), -  
    SPACE(CYL(10,10)), -  
    VOLCNT(5), -  
    DSNLOG(XXXXXXXXXX(LOGDDNAM(MQEXL))),START= WARM
```

The SCANNER – Sample Process

- WLM Boost: used to issue –DIS THD(*) SERVICE WAIT commands when thread spikes occur.

```
BOOST -  
  SUBSYSTEM(DB6P) -  
  GROUP(DSNDB0P) -  
  GROUP_ATTACH(DB0P) -  
  THREADS(120) -  
  CHASE ( -  
    ITERATIONS(3) -  
    INTERVAL(5) -  
  )
```

Thank You !

Questions ?