

Integrated alive and devIocStats in snmpTest IOC

Nam Seung Hee*
Control Team
Rare Isotope Science Project
Institute for Basic Science
Daejeon, South Korea

May 13, 2015

Abstract

snmpTest IOC에 alive와 devIocStats를 라이브러리화 시켜 integration하는 방법을 알아보았다.

1 Integrated alive in snmpTest IOC

1.1 Changing src Makefile of snmpTest

- Add the header file address

```
USR_INCLUDES += -I${EPICS_SYNAPPS}/alive-1-0/include
```

- Add the dbd file address

```
USR_DBDFLAGS += -I${EPICS_SYNAPPS}/alive-1-0/aliveApp/src
```

- Add the LIB address

```
alive_DIR += ${EPICS_SYNAPPS}/alive-1-0/lib/${T_A}
```

- Add the dbd file

*namsh@ibs.re.kr

```
snmpTest_DBD += aliveRecord.dbd
snmpTest_DBD += aliveSupport.dbd
```

- Add the LIB file

```
snmpTest_LIBS += alive
```

Makefile

```
TOP=../..

include $(TOP)/configure/CONFIG

USR_INCLUDES += -I${RAON_SITELIBS}/include/
USR_DBDFLAGS += -I${RAON_SITELIBS}/dbd/
USR_INCLUDES += -I${EPICS_SYNAPPS}/include

USR_DBDFLAGS += -I${EPICS_SYNAPPS}/alive-1-0/aliveApp/src
USR_INCLUDES += -I${EPICS_SYNAPPS}/alive-1-0/include

snmpMon_DIR += ${RAON_SITELIBS}/lib/${T_A}
timeStamp_DIR += ${RAON_SITELIBS}/lib/${T_A}

alive_DIR += ${EPICS_SYNAPPS}/alive-1-0/lib/${T_A}

#-----
#  ADD MACRO DEFINITIONS AFTER THIS LINE
#=====

#=====
# Build the IOC application

PROD_IOC = snmpTest
# snmpTest.dbd will be created and installed
DBD += snmpTest.dbd

# snmpTest.dbd will be made up from these files:
snmpTest_DBD += base.dbd
snmpTest_DBD += snmpRecord.dbd
snmpTest_DBD += timestampRecord.dbd

snmpTest_DBD += aliveRecord.dbd
snmpTest_DBD += aliveSupport.dbd

# Include dbd files from all support applications:
#snmpTest_DBD += xxx.dbd
snmpTest_DBD += snmpDevSoft.dbd
snmpTest_DBD += timestampDevSoft.dbd

# Add all the support libraries needed by this IOC
#snmpTest_LIBS += xxx
snmpTest_LIBS += snmpMon timeStamp

snmpTest_LIBS += alive
```

```
# snmpTest_registerRecordDeviceDriver.cpp derives from snmpTest.dbd
snmpTest_SRCS += snmpTest_registerRecordDeviceDriver.cpp

# Build the main IOC entry point on workstation OSs.
snmpTest_SRCS_DEFAULT += snmpTestMain.cpp
snmpTest_SRCS_vxWorks += -nil-

# Add support from base/src/vxWorks if needed
#snmpTest_OBJS_vxWorks += $(EPICS_BASE_BIN)/vxComLibrary

# Finally link to the EPICS Base libraries
snmpTest_LIBS += $(EPICS_BASE_IOC_LIBS)

#=====

include $(TOP)/configure/RULES
#-----
# ADD RULES AFTER THIS LINE
```

1.2 Copy db and changing Db Makefile of snmpTest

Copy alive db

```
namsh@namsh:~/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db$ ls
0.Common alive.db 0.linux-x86_64 timestamp.vdb Makefile xerox.vdb
```

Changing Db Makefile of snmpTest

- Add the db file

```
DB += alive.db
```

Makefile

```
TOP=../..
include $(TOP)/configure/CONFIG
#-----
# ADD MACRO DEFINITIONS AFTER THIS LINE

#-----
# Optimization of db files using dbst (DEFAULT: NO)
#DB_OPT = YES

#-----
# Create and install (or just install) into <top>/db
# databases, templates, substitutions like this
#DB += xxx.db
DB += xerox.vdb
DB += timestamp.vdb

DB += alive.db

#-----
# If <anyname>.db template is not named <anyname>*.template add
# <anyname>_template = <templatename>

include $(TOP)/configure/RULES
#-----
# ADD RULES AFTER THIS LINE
```

1.3 Changing st.cmd of snmpTest

Add the dbLoadRecords

```
#!/../bin/linux-x86_64/snmpTest

## You may have to change snmpTest to something else
## everywhere it appears in this file

< envPaths

cd "${TOP}"

## Register all support components
dbLoadDatabase "dbd/snmpTest.dbd"
snmpTest_registerRecordDeviceDriver pdbbase

## Load record instances
#dbLoadRecords("db/xxx.db", "user=mijoy0909Host")
dbLoadRecords("db/xerox.vdb", "HOST=10.1.6.232, COM=public, V2C=SNMP_VERSION_2c, PR=Printer-MIB
::")
dbLoadRecords("db/timestamp.vdb", "S=SNMPIOC")

dbLoadRecords "db/alive.db", "P=aliveEx:,RHOST=10.1.6.104"

cd "${TOP}/iocBoot/${IOC}"
iocInit

## Start any sequence programs
#seq sncxxx, "user=mijoy0909Host"
st.cmd (END)
```

2 Integrated devIocStats in snmpTest IOC

2.1 Changing src Makefile of snmpTest

- Add the header file address

```
USR_INCLUDES += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/include/os/Linux
USR_INCLUDES += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/devIocStats
```

- Add the dbd file address

```
USR_DBDFLAGS += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/dbd
```

- Add the LIB address

```
devIocStats_DIR += ${EPICS_SYNAPPS}/devIocStats-3-1-13/lib/${T_A}
```

- Add the dbd file

```
snmpTest_DBD += devIocStats.dbd
snmpTest_DBD += devVxStats.dbd
snmpTest_DBD += iocAdmin.dbd
```

- Add the LIB file

```
snmpTest_LIBS += devIocStats
```

Makefile

```
TOP=../..

include $(TOP)/configure/CONFIG

USR_INCLUDES += -I${RAON_SITELIBS}/include/
USR_DBDFLAGS += -I${RAON_SITELIBS}/dbd/
USR_INCLUDES += -I${EPICS_EXTENSIONS}/include

USR_DBDFLAGS += -I${EPICS_SYNAPPS}/alive-1-0/aliveApp/src
USR_INCLUDES += -I${EPICS_SYNAPPS}/alive-1-0/include

USR_INCLUDES += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/include/os/Linux
USR_INCLUDES += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/devIocStats
USR_DBDFLAGS += -I${EPICS_SYNAPPS}/devIocStats-3-1-13/dbd

snmpMon_DIR += ${RAON_SITELIBS}/lib/${T_A}
timeStamp_DIR += ${RAON_SITELIBS}/lib/${T_A}
alive_DIR += ${EPICS_SYNAPPS}/alive-1-0/lib/${T_A}

devIocStats_DIR += ${EPICS_SYNAPPS}/devIocStats-3-1-13/lib/${T_A}

#-----
#  ADD MACRO DEFINITIONS AFTER THIS LINE
#=====

#=====
# Build the IOC application

PROD_IOC = snmpTest
# snmpTest.dbd will be created and installed
DBD += snmpTest.dbd

# snmpTest.dbd will be made up from these files:
snmpTest_DBD += base.dbd
snmpTest_DBD += snmpRecord.dbd
snmpTest_DBD += timestampRecord.dbd
snmpTest_DBD += aliveRecord.dbd
snmpTest_DBD += aliveSupport.dbd

snmpTest_DBD += devIocStats.dbd
snmpTest_DBD += devVxStats.dbd
snmpTest_DBD += iocAdmin.dbd

# Include dbd files from all support applications:
#snmpTest_DBD += xxx.dbd
snmpTest_DBD += snmpDevSoft.dbd
snmpTest_DBD += timestampDevSoft.dbd

# Add all the support libraries needed by this IOC
#snmpTest_LIBS += xxx
snmpTest_LIBS += snmpMon timeStamp
snmpTest_LIBS += alive
```

```
snmpTest_LIBS += devIocStats

# snmpTest_registerRecordDeviceDriver.cpp derives from snmpTest.dbd
snmpTest_SRCS += snmpTest_registerRecordDeviceDriver.cpp

# Build the main IOC entry point on workstation OSs.
snmpTest_SRCS_DEFAULT += snmpTestMain.cpp
snmpTest_SRCS_vxWorks += -nil-

# Add support from base/src/vxWorks if needed
#snmpTest_OBJS_vxWorks += $(EPICS_BASE_BIN)/vxComLibrary

# Finally link to the EPICS Base libraries
snmpTest_LIBS += $(EPICS_BASE_IOC_LIBS)

#=====

include $(TOP)/configure/RULES
#-----
# ADD RULES AFTER THIS LINE
```

2.2 Copy db and changing Db Makefile of snmpTest

Copy devIocStats db

```
namsh@namsh:~/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db$ ls
access.db          iocAdminSoft.db    iocEnvVar.db       iocScanMon.db      0.Common
alive.db           iocAdminVxWorks.db iocGeneralTime.db   iocScanMonSum.db   0.linux-x86_64
iocAdminRTEMS.db   iocCluster.db      iocRTEMSOnly.db    iocVxWorksOnly.db  timestamp.vdb
iocAdminScanMon.db ioc.db             iocRTOS.db         Makefile            xerox.vdb
```

Changing Db Makefile of snmpTest

- Add the db file

```
DB += access.db
DB += iocAdminSoft.db
DB += iocEnvVar.db
DB += iocScanMon.db
DB += iocAdminVxWorks.db
DB += iocGeneralTime.db
DB += iocScanMonSum.db
DB += iocAdminRTEMS.db
DB += iocRTEMSOnly.db
DB += iocVxWorksOnly.db
DB += iocCluster.db
DB += iocAdminScanMon.db
DB += ioc.db
DB += iocRTOS.db
```

Makefile

```
TOP=../..
include $(TOP)/configure/CONFIG
#-----
# ADD MACRO DEFINITIONS AFTER THIS LINE

#-----
```

```

# Optimization of db files using dbst (DEFAULT: NO)
#DB_OPT = YES

#-----
# Create and install (or just install) into <top>/db
# databases, templates, substitutions like this
#DB += xxx.db
DB += xerox.vdb
DB += timestamp.vdb
DB += alive.db

DB += access.db
DB += iocAdminSoft.db
DB += iocEnvVar.db
DB += iocScanMon.db
DB += iocAdminVxWorks.db
DB += iocGeneralTime.db
DB += iocScanMonSum.db
DB += iocAdminRTEMS.db
DB += iocRTEMSOnly.db
DB += iocVxWorksOnly.db
DB += iocCluster.db
DB += iocAdminScanMon.db
DB += ioc.db
DB += iocRTOS.db

#-----
# If <anyname>.db template is not named <anyname>*.template add
# <anyname>_template = <templatename>

include $(TOP)/configure/RULES
#-----
# ADD RULES AFTER THIS LINE

```

2.3 Changing st.cmd of snmpTest

Add the dbLoadRecords

```

#!../bin/linux-x86_64/snmpTest

## You may have to change snmpTest to something else
## everywhere it appears in this file

< envPaths

cd "${TOP}"

## Register all support components
dbLoadDatabase "dbd/snmpTest.dbd"
snmpTest_registerRecordDeviceDriver pdbname

## Load record instances
#dbLoadRecords("db/xxx.db", "user=mijoy0909Host")
dbLoadRecords("db/xerox.vdb", "HOST=10.1.6.232, COM=public, V2C=SNMP_VERSION_2c, PR=Printer-MIB
:")
dbLoadRecords("db/timestamp.vdb", "S=SNMPIOC")
dbLoadRecords "db/alive.db", "P=aliveEx:,RHOST=10.1.6.104"

dbLoadDatabase("dbd/testIocStats.dbd",0,0)
## Load all record instances (VxWorks)

```

```

#dbLoadRecords("db/iocAdminVxWorks.db","IOC=IOCTEST")
## or load only those records for RTEMS IOCs
#dbLoadRecords("db/iocAdminRTEMS.db","IOC=IOCTEST")
## or load only those records for Soft IOCs
dbLoadRecords("db/iocAdminSoft.db","IOC=IOCTEST")
## optionally load the SCAN monitoring records
#dbLoadRecords("db/iocAdminScanMon.db","IOC=IOCTEST")
#dbLoadRecords("db/testIocAdminRelease.db","IOC=IOCTEST")

cd "${TOP}/iocBoot/${IOC}"
iocInit

## Start any sequence programs
#seq sncxxx,"user=mijoy0909Host"
st.cmd (END)

```

3 Compile and operating EPICS

3.1 Compile snmpTest

```

namsh@namsh:~/epics/R3.14.12.5/siteApps/snmpTest$ make
make -C ./configure install
make[1]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/configure'
make -C 0.linux-x86_64 -f ../Makefile TOP=../.. \
T_A=linux-x86_64 install
make[2]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/configure/0.linux-
x86_64'
perl /home/namsh/epics/R3.14.12.5/base/bin/linux-x86_64/convertRelease.pl checkRelease
make[2]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/configure/0.linux-
x86_64'
make[1]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/configure'
make -C ./snmpTestApp install
make[1]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp'
make -C ./src install
make[2]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/src'
make -C 0.linux-x86_64 -f ../Makefile TOP=../.. \
T_A=linux-x86_64 install
make[3]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/src/0.
linux-x86_64'
make[3]: Nothing to be done for 'install'.
make[3]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/src/0.linux
-x86_64'
make[2]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/src'
make -C ./Db install
make[2]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db'
make -C 0.linux-x86_64 -f ../Makefile TOP=../.. \
T_A=linux-x86_64 install
make[3]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db/0.linux
-x86_64'
make[3]: Nothing to be done for 'install'.
make[3]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db/0.linux-
x86_64'
make[2]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp/Db'
make[1]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/snmpTestApp'
make -C ./iocBoot install
make[1]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/iocBoot'
make -C ./iocsnmpTest install
make[2]: Entering directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/iocBoot/iocsnmpTest'

```



```

make[2]: Nothing to be done for 'install'.
make[2]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/iocBoot/iocsnmpTest'
make[1]: Leaving directory '/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/iocBoot'

```

3.2 Operating EPICS

Operating EPICS

```

namsh@namsh:~/epics/R3.14.12.5/siteApps/snmpTest/iocBoot/iocsnmpTest$ ./st.cmd
#!../bin/linux-x86_64/snmpTest
## You may have to change snmpTest to something else
## everywhere it appears in this file
< envPaths
epicsEnvSet("ARCH","linux-x86_64")
epicsEnvSet("IOC","iocsnmpTest")
epicsEnvSet("TOP","/home/namsh/epics/R3.14.12.5/siteApps/snmpTest")
cd "/home/namsh/epics/R3.14.12.5/siteApps/snmpTest"
## Register all support components
dbLoadDatabase "dbd/snmpTest.dbd"
snmpTest_registerRecordDeviceDriver pdbname
## Load record instances
#dbLoadRecords("db/xxx.db","user=mijoy0909Host")
dbLoadRecords("db/xerox.vdb", "HOST=10.1.6.232, COM=public, V2C=SNMP_VERSION_2c, PR=Printer-MIB
: ")
dbLoadRecords("db/timestamp.vdb", "S=SNMPIOC")
dbLoadRecords "db/alive.db", "P=aliveEx:,RHOST=10.1.6.104"
dbLoadDatabase("dbd/testIocStats.dbd",0,0)
filename=../dbLexRoutines.c" line number=240
## Load all record instances (VxWorks)
#dbLoadRecords("db/iocAdminVxWorks.db","IOC=IOCTEST")
## or load only those records for RTEMS IOCs
#dbLoadRecords("db/iocAdminRTEMS.db","IOC=IOCTEST")
## or load only those records for Soft IOCs
dbLoadRecords("db/iocAdminSoft.db","IOC=IOCTEST")
## optionally load the SCAN monitoring records
#dbLoadRecords("db/iocAdminScanMon.db","IOC=IOCTEST")
#dbLoadRecords("db/testIocAdminRelease.db","IOC=IOCTEST")
cd "/home/namsh/epics/R3.14.12.5/siteApps/snmpTest/iocBoot/iocsnmpTest"
iocInit
Starting iocInit
#####
## EPICS R3.14.12.5 $Date: Tue 2015-03-24 09:57:35 -0500$
## EPICS Base built Mar 30 2015
#####
iocRun: All initialization complete
## Start any sequence programs
#seq sncxx,"user=mijoy0909Host"
epics>

```

PV

```

epics> dbl
IOCTEST:CA_CLNT_CNT
IOCTEST:CA_CONN_CNT
IOCTEST:CPU_CNT
IOCTEST:FD_CNT
IOCTEST:FD_MAX
IOCTEST:GTIM_TIME
IOCTEST:IOC_CPU_LOAD
IOCTEST:LOAD

```

IOCTEST:MEM_FREE
IOCTEST:MEM_MAX
IOCTEST:MEM_USED
IOCTEST:RECORD_CNT
IOCTEST:SUSP_TASK_CNT
IOCTEST:SYS_CPU_LOAD
IOCTEST:CA_UPD_TIME
IOCTEST:FD_UPD_TIME
IOCTEST:LOAD_UPD_TIME
IOCTEST:MEM_UPD_TIME
IOCTEST:GTIM_RESET
IOCTEST:FD_FREE
IOCTEST:HEARTBEAT
IOCTEST:START_CNT
IOCTEST:GTIM_ERR_CNT
IOCTEST:ACCESS
IOCTEST:APP_DIR1
IOCTEST:APP_DIR2
IOCTEST:CA_ADDR_LIST
IOCTEST:CA_AUTO_ADDR
IOCTEST:CA_BEAC_TIME
IOCTEST:CA_CONN_TIME
IOCTEST:CA_MAX_ARRAY
IOCTEST:CA_RPTR_PORT
IOCTEST:CA_SRCH_TIME
IOCTEST:CA_SVR_PORT
IOCTEST:ENGINEER
IOCTEST:EPICS_VERS
IOCTEST:GTIM_CUR_SRC
IOCTEST:GTIM_EVT_SRC
IOCTEST:GTIM_HI_SRC
IOCTEST:HOSTNAME
IOCTEST:IOC_LOG_INET
IOCTEST:IOC_LOG_PORT
IOCTEST:KERNEL_VERS
IOCTEST:LOCATION
IOCTEST:STARTTOD
IOCTEST:ST_SCRIPT1
IOCTEST:ST_SCRIPT2
IOCTEST:TIMEZONE
IOCTEST:TOD
IOCTEST:TS_NTP_INET
IOCTEST:UPTIME
IOCTEST:READACF
IOCTEST:SYSRESET
IOCTEST:SysReset
IOCTEST:APP_DIR
IOCTEST:EPICS_VERSION
IOCTEST:ST_SCRIPT
xerox_TR1
xerox_TR2
xerox_TR3
xerox_TR4
xerox_TR5
xerox_toner_B
xerox_toner_C
xerox_toner_M
xerox_toner_Y
xerox_toner_drum_B
xerox_toner_drum_C
xerox_toner_drum_M
xerox_toner_drum_Y

```
xerox_toner_waste  
SNMPIOC:TIMESTAMP  
aliveEx:alive
```