

# Activating the Natural Buffer Pool on UNIX

Because the Natural buffer pool requires resources that must be created every time your system is booted, a procedure to activate the buffer pool must be called during system startup. This procedure is different for each operating system.

Therefore, please proceed as described in the section appropriate to your operating system below:

- Preparing the System V Style Startup Procedure
- Preparing the Startup Procedure rc (AIX)
- Change Kernel Parameters

To verify the operation of the buffer pool, invoke the NATBPMON Utility, which is used to monitor the buffer pool's activity.

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## Preparing the System V Style Startup Procedure

The procedure **sagnatbp** which is used to invoke the Natural buffer pool during system startup is automatically copied to the **init.d** system directory during the Natural installation process.

The following table shows where the **init.d** and **rc3.d** directories are located on the various platforms. In the following description, **init.d** or **rc3.d** stand for the relevant path indicated below for the platform you are using.

Platform	System Directory for Initialization	Run Level Startup Directory
Solaris	/etc/init.d	/etc/rc3.d
HP-UX	/sbin/init.d	/sbin/rc3.d
DEC UNIX / Tru64	/sbin/init.d	/sbin/rc3.d
SCO UnixWare	/etc/init.d	/etc/rc3.d
Linux	/etc/rc.d/init.d	/etc/rc.d/rc3.d or /etc/rc.d/rc5.d

You must copy this buffer pool procedure to the run level 3 startup directory of your UNIX machine. The **rc3.d** directory contains several Bourne shell scripts that start with "S", followed by a number, for example 99. If you add a file to this directory, the code contained in it is executed when the system changes to "multi-user mode".

A sample copy of **sagnatbp** is shown below. It can be edited with a text editor.

1. Log in as user "root".
2. Create a backup copy of your current **S99natbp** file contained in the **rc3.d** directory (see table above).
3. Check the environment variable settings (NATDIR, NATVERS, NATADM) in the **sagnatbp** procedure.

<b>NATDIR</b>	Location where Natural was installed.
<b>NATVERS</b>	Natural version number.
<b>NATADM</b>	The login name of the Natural system administrator responsible for this buffer pool. It is assumed that this administrator account is called "sag", and that the user ID is already known to the system. It does not have to be a user with root privileges.

**Note:**

The Bourne shell does not allow blanks before and after the equals sign in the lines to be customized.

4. Copy the **sagnatbp** file to the **rc3.d** directory and rename it to **S99natbp**.
5. If an error occurs, you can start again with the backup copy after the deletion of the modified **S99natbp** file contained in the **rc3.d** directory.

**Sample of "sagnatbp" File:**

```

#!/bin/sh
#
# Copyright (c) 2002 Software AG, Germany.
#   All rights reserved.
#
# Start/stop script for Natural Bufferpool
#
#-----

NATDIR=/usr/SAG/nat
NATVERS=vn
NATADM=sag
export NATDIR NATVERS
#
#-----
#
natstart=${NATDIR}/${NATVERS}/bin/natstart.bsh
natbpmon=${NATDIR}/${NATVERS}/bin/natbpmon

if [ "${LOGNAME}" = "" ]; then

    LOGNAME=root
    HOME=/

    export LOGNAME HOME
    UNDO=1
else
    UNDO=0    fi
case "$1" in
start)
echo "Starting Natural Bufferpool ..."
    if [ -x "${natstart}" ]; then
        su $NATADM -c "${natstart}" > /dev/console 2> /dev/console
    else
        exit 1
    fi
echo "done..."
;;
stop)
echo "Stopping Natural Bufferpool ..."
    if [ -x "${natbpmon}" ]; then
        su $NATADM -c "${natbpmon} shutdown" > /dev/console 2> /dev/console
    else
        exit 1
    fi
echo "done..."
;;
*)
echo "Usage: $0 {start|stop}"
exit 1
;;
esac
if [ ${UNDO} ]; then
unset LOGNAME HOME
fi
unset UNDO
#
#-----

```

The procedure "natstart.bsh" is called automatically by the system startup procedure and is used to initialize the Natural environment. It needs no customization and is stored under: \$NATDIR/\$NATVERS/bin/natstart.bsh.

## Preparing the Startup Procedure rc (AIX)

The procedure to invoke the Natural buffer pool during system startup is contained in the directory "/etc/rc", which is a Bourne shell script. A sample copy of this procedure can be found on the installation tape under the name **rc.sag**.

1. Log in as user "root".
2. Create a backup copy of your current "/etc/rc" file.
3. Include the following lines into "/etc/rc":

```
#
# Load Software AG Processes semiautomatically
#
if [ -x /etc/rc.sag ]
then
echo " "
echo "Now I start all Software AG processes ..."
/etc/rc.sag
echo " "
fi
```

4. Verify your changes to make sure that the changes made to the procedure consist only of those changes desired. If an error occurs, you can start again with the backup copy. A sample of **rc.sag** is shown below.
5. Copy the file **rc.sag** to "/etc/rc.sag".

**Note:**

Site-specific changes to this procedure may exist on your computer; they might be lost by adding the Natural buffer pool startup code.

**Sample of "rc.sag" File:**

```

#-----
# announce start of local rc
#
echo "rc.sag started at 'date'" > /dev/console
#=====
#
# Start up the development version of natural. this section should be
# duplicated for each incarnation of the natural nucleus. due to
# security considerations, the procedure is called after changing the
# user and group id with the su command to the responsible natural
# system administrator.
#
NATDIR=/usr/SAG/nat      # customize
NATVERS=vn              # customize
NATADM=sag              # customize
#
#-----
natstart=$NATDIR/$NATVERS/bin/natstart.bsh
export NATDIR NATVERS NATADM
#
if [ -f ${natstart} ]
then
#
if [ "${LOGNAME}" = "" ]
then
LOGNAME=root
HOME=/
export LOGNAME HOME
UNDO=1
else
UNDO=0
fi
#
echo "calling ${natstart} for user ${NATADM}" > /dev/console
su ${NATADM} -c ${natstart} > /dev/console 2> /dev/console
#
if [ ${UNDO} ]
then
unset LOGNAME HOME
fi
unset UNDO
#
else
echo "${natstart} not found, natural not started" > /dev/console
fi
unset NATDIR NATVERS NATADM
#=====
# announce end of local rc
#
echo "rc.sag finished at 'date'" > /dev/console
#

```

**Note:**

Site-specific changes to this procedure may exist on your computer; they might be lost by adding the Natural buffer pool startup code.

Because environment variables are not known during system startup, they must be specified manually in **rc.sag**. Therefore, change the following variables:

<b>NATDIR</b>	Location where Natural was installed.
<b>NATVERS</b>	Natural version number.
<b>NATADM</b>	The login name of the Natural system administrator responsible for this buffer pool. It is assumed that this administrator account is called "sag", and that the user ID is already known to the system. It does not have to be a user with root privileges.

**Note:**

The Bourne shell does not allow blanks before and after the equal sign in the lines to be customized.

The procedure "natstart.bsh" is called automatically by the system startup procedure and is used to initialize the Natural environment. It needs no customization and is stored under: \$NATDIR/\$NATVERS/bin/natstart.bsh.

## Change Kernel Parameters

- Solaris, HP-UX, DEC UNIX / Tru64, SCO UnixWare
- AIX

### Solaris, HP-UX, DEC UNIX / Tru64, SCO UnixWare

The Natural buffer pool needs the following operating system resources for its operation:

- A set of semaphores to enable synchronization between the users.
- Shared memory to store the buffer pools objects.

The amount of available shared memory and the semaphores are configured in the kernel. For information on how to change your current kernel, contact your system administrator or consult your respective operating system documentation.

**Note:**

Since semaphores are also needed to synchronize the access to Natural system files, additional operating-system resources should be considered here, too; see also System File Simulation.

The following abbreviations are used:

<b>NBP</b>	Number of buffer pools running on one computer.
<b>SMU</b>	Sum of all "Maxuser" parameters for all buffer pools.
<b>MAXMEM</b>	Largest "Memsize" value for all buffer pools.
<b>NSF</b>	Number of system files used.

If you have only one buffer pool on your computer, the following values are used:

<b>NBP</b>	= 1
<b>SMU</b>	= "Maxuser" (from NATPARM)
<b>MAXMEM</b>	= "Memsize"

As not all resources defined by the default parameter settings are used during normal system operation, the default values are sufficient to operate one buffer pool supporting up to 20 users using about 1 MB of memory.

**Note:**

You can find the default values specific to your environment in your kernel configuration file. Do not decrement any kernel parameters that are above their default values, as other software may need the larger value.

Change the following kernel parameters to the required values as follows:

Name	Required Value
<b>SEMAEM</b>	must be at least SMU
<b>SEMMNI</b>	increment by (NBP + NSF)
<b>SEMMNS</b> *)	increment by (SMU + 5 * NBP) + NSF
<b>SEMMNU</b> *)	increment by SMU
<b>SEMMSL</b>	must be at least SMU + 4
<b>SEMUME</b>	must be at least 5
<b>SEMVMX</b>	must be at least SMU
<b>SHMMAX</b>	must be at least MAXMEM
<b>SHMMNI</b>	increment by NBP
<b>SHMSEG</b>	must be at least 4

\*) Not available under DEC UNIX.

Review the changes made to the file **S99natbp** in your **rc3.d** directory in case the startup message is not displayed during rebooting.

**Note:**

If the system should fail to boot after modification (that is, the new kernel cannot be booted), check if there is an error in the startup procedure. Detailed information about trouble-shooting the operating system can be found in your respective operating system manuals.

If you cannot solve the problem, contact Software AG support.

**HP-UX 11.0 64 Bit**

To link the Natural nucleus on HP-UX 11.0 64 Bit, you have to set the HP-UX parameters Maximum Process Data Segment Size (MAXDSIZ) and Maximum Process Test Segment Size (MAXTSIZ) to 128 MB.

To set the kernel parameters use the System Administration Manager (SAM). Select Kernel Configuration > Configurable Parameters. Here you can edit both parameters. After you have edited the parameters reboot the machine.

**AIX Kernel Parameters**

Since AIX dynamically adjusts the IPC configuration, kernel parameter changes are not required.