

RDK-B Build instructions for Emulator and RPI on Ubuntu 18.04 Host Machine

- 1. Introduction
- 2. Environment Setup for Emulator and Raspberry Pi
 - 2.1. Setting up the Host Environment
 - 2.1.1. Install OS - Ubuntu-18.04
 - 2.1.2. Install the following packages for setting up your host VM
 - 2.1.3. Configure bash as default command interpreter for shell scripts
 - 2.1.4. Configure Git
 - 2.1.5. Configure repo
 - 2.1.6. Setting up .netrc for RDK emulator and Raspberry Pi
 - 2.2. Downloading Source Code & Building
 - 2.2.1. Downloading Source Code
 - 2.2.2. Building
- 3. Troubleshooting
 - 3.1. Error Messages during bitbake for Emulator and solutions.
 - 3.1.1. Error 1
 - 3.1.2. Error 2
 - 3.1.3. Error 3
 - 3.2. Error Messages during bitbake for Raspberry Pi and solutions.
 - 3.2.1. Error 1
 - 3.2.2. Error 2
 - 3.2.3. Error 3
 - 3.3. Special Considerations
- 4. Support



This Page is under Development

1. Introduction

Raspberry Pi: The Raspberry Pi 3 Model B+ featuring a 64-bit quad core **processor** running at 1.4 Ghz. R-Pi3 B+ supports the dual band 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN which provides an high edge for the broadband developer community to test the RDK-B stack with Router, WiFi functionalities.

2. Environment Setup for Emulator and Raspberry Pi

2.1. Setting up the Host Environment

Pre-Requisites

Requirement	Remarks
Linux	32 bit Ubuntu 18.04 OS
Free HDD Space	Minimum 100GB Free Memory
Oracle Virtual Box	4.3.18 or higher
Wireless Adapter	Brand Name: Tenda ralink & Model Number:W311MI TPLink Archer T4U AC1200
USB to Ethernet Switch	To connect with Ethernet Switch & Multiple Clients

2.1.1. Install OS - Ubuntu-18.04

This step is for one time setup for downloading & building RDK-B Emulator and Raspberry Pi in a standalone machine.

- Download Ubuntu-18.04.

2.1.2. Install the following packages for setting up your host VM

The instructions provided below are meant to be executed via the command line on an Ubuntu machine:

```
$ sudo apt-get install build-essential gettext bison libfile-slurp-perl gawk libncurses-dev autoconf flex doxygen libtool automake libpcre3-dev  
zlib1g-dev libbz2-dev subversion minicom putty libssl-dev rpm python-pexpect python-svn python-argparse vim tofrodos meld dos2unix cmake uuid-dev  
ruby transfig libgl2.0-dev xutils-dev lynx-cur gperf autopoint python-dulwich python-dev curl vim diffstat texinfo chrpath openjdk-8-jre
```

2.1.3. Configure bash as default command interpreter for shell scripts

```
$ sudo dpkg-reconfigure dash
```

Select "No"

To choose bash, when the prompt asks if you want to use dash as the default system shell - select "No"

2.1.4. Configure Git

Upgrade your Git version to 1.8.x or higher

On Ubuntu 16.04 LTS, if you are unable to upgrade your git version using apt-get, then follow the below steps in order to upgrade

```
$ sudo apt-get install python-software-properties
```

```
$ sudo add-apt-repository ppa:git-core/ppa
```

```
$ sudo apt-get update
```

```
$ sudo apt-get install git
```

Once git is installed, configure your name and email using the below commands

```
$ git config --global user.email "you@example.com"
```

```
$ git config --global user.name "Your Name"
```

2.1.5. Configure repo

In order to use Yocto build system, first you need to make sure that repo is properly installed on the machine:

```
$ mkdir ~/bin
```

```
$ PATH=~/bin:$PATH
```

```
$ curl https://storage.googleapis.com/git-repo-downloads/repo > ~/bin/repo
```

```
$ chmod a+x ~/bin/repo
```

Trivia : Repo is a repository management tool that is built on top of Git. Its main purpose is to help manage projects that consist of many Git repositories, it can also be used to manage uploads to the CMF Gerrit instance and automate aspects of the development workflow.

Repo does not replace Git, it simply aids management of projects that contain multiple Git repositories into a single local working directory. Git will still be used for local operation such as commits etc.

Repo manages this for you by means of an XML based Manifest file. The Manifest file defines which repositories the project uses and links to appropriate revisions of each git repository, i.e where the upstream repositories reside and where they should be cloned locally. It is the manifest.xml (or default.xml) that determines which Git repositories and revisions repo will manage. This manifest.xml file is hosted in a Git repository along with all the other git repositories.

2.1.6. Setting up .netrc for RDK emulator and Raspberry Pi

CMF git uses https. This step prevents the password prompt every now and then during code checkout and build.

Create a file .netrc in home directory.

```
$ vi .netrc
```

The contents of the .netrc should be as follows:

```
machine code.rdkcentral.com
```

```
login <YOUR_USERNAME>
```

```
password <YOUR_PASSWORD>
```

2.2. Downloading Source Code & Building

2.2.1. Downloading Source Code

Following commands fetch the source code of emulator and raspberry pi using repo tool

```
$ mkdir emulator or RaspberryPi && cd emulator or RaspberryPi
```

Please use the following repo init command

```
$ repo init -u https://code.rdkcentral.com/r/manifests -m rdkb.xml -b <branch_name> ( common for both Emulator and Raspberry Pi )
```

(Example 1: repo init -u <https://code.rdkcentral.com/r/manifests> -m rdkb.xml -b rdkb-20180527

Example 2: repo init -u <https://code.rdkcentral.com/r/manifests> -m rdkb.xml -b master

Example 3: repo init -u <https://code.rdkcentral.com/r/manifests> -m rdkb.xml -b morty)

```
$ repo sync -j4 --no-clone-bundle ( common for both Emulator and Raspberry Pi )
```



- Cloning the code before login once to code.rdkcentral.com, user would get the Authentication error, even though the account is in good standing and has all the required access.
- Please login to code.rdkcentral.com before attempting to clone.

2.2.2. Building

For Emulator:

```
$ source meta-cmf-bsp-emulator/setup-environment
```

The above step configures and sets up your directory to start an appropriate build for broadband.

There are different kinds of builds listed. Please read the options and select the number of the build you need.

- 1) meta-rdk-bsp-emulator/conf/machine/qemuarmbroadband.conf
- 2) meta-rdk-bsp-emulator/conf/machine/qemux86broadband.conf
- 3) meta-rdk-bsp-emulator/conf/machine/qemux86hyb.conf
- 4) meta-rdk-bsp-emulator/conf/machine/qemux86mc.conf
- 5) openembedded-core/meta/conf/machine/qemuarm.conf
- 6) openembedded-core/meta/conf/machine/qemux86-64.conf
- 7) openembedded-core/meta/conf/machine/qemux86.conf

- Select option (option: 2) for qemux86broadband , if you need to build a RDK-B emulator.

For Raspberry Pi:

```
$ source meta-cmf-raspberrypi/setup-environment (Select option raspberrypi-rdk-broadband.conf).
```

Next, you would need to initiate the build using the following command:

```
$ bitbake rdk-generic-broadband-image ( common for both Emulator and Raspberry Pi).
```

Image path for Emulator:

On Successful build, the ROOTFS (in vmdk format) would be available at the following reference location based on the build type:

```
- ${HOME}/emulator/build-qemux86broadband/tmp/deploy/images/qemux86broadband/rdk-generic-broadband-image-qemux86broadband-  
<timestamp>.vmdk
```

Example:

```
.../build-qemux86broadband/tmp/deploy/images/qemux86broadband/rdk-generic-broadband-image-qemux86broadband-20160217080610.vmdk
```

Image path for Raspberry Pi:

On Successful build, the ROOTFS (in sdimg format) would be available at the following reference location based on the build type:

- `${HOME}/RaspberryPi/build-raspberrypi-rdk-broadband/tmp/deploy/images/raspberrypi-rdk-broadband/rdkb-generic-broadband-image-raspberrypi-rdk-broadband.rpi-sdimg`

Example:

`.../build-raspberrypi-rdk-broadband/tmp/deploy/images/raspberrypi-rdk-broadband/rdkb-generic-broadband-image_default_20200206062343.rootfs.rpi-sdimg`

3. Troubleshooting

3.1. Error Messages during bitbake for Emulator and solutions.

3.1.1. Error 1

```
/usr/include/x86_64-linux-gnu/bits/mman-shared.h:46:5: note: previous declaration of 'memfd_create' was here
| int memfd_create (const char *__name, unsigned int __flags) __THROW;
| ^~~~~~
| /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/rules.mak:59: recipe for target 'util
| /memfd.o' failed
| make: *** [util/memfd.o] Error 1
| make: *** Waiting for unfinished jobs....
| /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c: In function 'follow_path':
| /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c:126:5: warning: this 'if
| clause does not guard... [-Wmisleading-indentation]
| if (!cursor->populated_entries)
| ^
| /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c:128:9: note: ...this
| statement, but the latter is misleadingly indented as if it were guarded by the 'if'
| cursor = *source;
| ^~~~~~
| WARNING: exit code 1 from a shell command.
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/qemu-
| native/2.7.0-r1/temp/log.do_compile.9718)
| ERROR: Task (virtual:native:/home/amrita/Desktop/Emu_Feb3/openembedded-core/meta/recipes-devtools/qemu/qemu_2.7.0.bb:do_compile) failed with
| exit code '1'
```

Solution:

Remove static keyword in function `int memfdcreate` in file `/x8664-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/memfd.c`

Pictorial representation of changes in `memfd.c` file:

```
#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#ifdef CONFIG_MEMFD
#include <sys/memfd.h>
#elif defined CONFIG_LINUX
#include <sys/syscall.h>
#include <asm/unistd.h>

static int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U
#endif
```

Original



```
#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#ifdef CONFIG_MEMFD
#include <sys/memfd.h>
#elif defined CONFIG_LINUX
#include <sys/syscall.h>
#include <asm/unistd.h>

int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

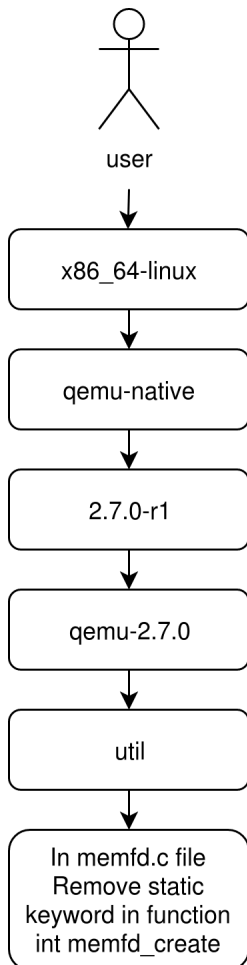
#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U
#endif
```

Modified

Patch file for changes in `memfd.c` attached below:

[memfd.patch](#)

Path for changes in memfd.c file:



3.1.2. Error 2

```
|/usr/include/gconv.h:26:36: fatal error: bits/types/___mbstate_t.h: No such file or directory
| #include <bits/types/___mbstate_t.h>
| ^
| compilation terminated.
| src/CMakeFiles/ucresolv.dir/build.make:89: recipe for target 'src/CMakeFiles/ucresolv.dir/res_query.c.o' failed
| make[2]: *** [src/CMakeFiles/ucresolv.dir/res_query.c.o] Error 1
| make[2]: Leaving directory '/home/amrita/Desktop/Emu_Feb3/build-qemu86broadband/tmp/work/i586-rdk-linux/ucresolv/git+AUTOINC+996c3778b1-r1/build'
| CMakeFiles/Makefile2:127: recipe for target 'src/CMakeFiles/ucresolv.dir/all' failed
| make[1]: *** [src/CMakeFiles/ucresolv.dir/all] Error 2
| make[1]: Leaving directory '/home/amrita/Desktop/Emu_Feb3/build-qemu86broadband/tmp/work/i586-rdk-linux/ucresolv/git+AUTOINC+996c3778b1-r1/build'
| Makefile:132: recipe for target 'all' failed
| make: *** [all] Error 2
| WARNING: exit code 2 from a shell command.
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Emu_Feb3/build-qemu86broadband/tmp/work/i586-rdk-linux/ucresolv/git+AUTOINC+996c3778b1-r1/temp/log.do_compile.29460)
| ERROR: Task (/home/amrita/Desktop/Emu_Feb3/meta-rdk-ext/recipes-support/ucresolv/ucresolv_1.0.bb:do_compile) failed with exit code '1'
```

Solution:

Copy `___mbstate_t.h` file from `build-qemu86broadband/tmp/work/i586-rdk-linux/ucresolv/git+AUTOINC+996c3778b1-r1/git/include/wcsmbits/bits/types` and put it in `build-qemu86broadband/tmp/sysroots/qemu86broadband/usr/include/bits/types`

Pictorial representation of changes in [ucresolv_1.0.bb](#) file:

```

SUMMARY = "ucresolv library"
DESCRIPTION = "Recipe to build library for uclibc resolver missing features"
HOMEPAGE = "https://github.com/Concast/libucresolv"

LICENSE = "Apache-2.0"
LIC_FILES_CHKSUM = "file://LICENSE;md5=e3fc50a88d0a364313df4b21ef20c29e"

SRCREV = "996c3778b14936c26b49e30f8dbb4933cb2df49a"
SRC_URI = "git://github.com/Concast/libucresolv.git"
PV = "git:${SRCPV}"
S = "${WORKDIR}/git"
DEPENDS = ""

PR = "r1"
inherit cmake pkgconfig
EXTRA_OECMAKE = "-DBUILD_TESTING=OFF -DBUILD_YOCTO=true"

FILES_${PN} += " \
    ${libdir}/* \
    "

FILES_SOLIBSDEV = ""
INSANE_SKIP_${PN} += "dev-so"

```

Original



```

SUMMARY = "ucresolv library"
DESCRIPTION = "Recipe to build library for uclibc resolver missing features"
HOMEPAGE = "https://github.com/Concast/libucresolv"

LICENSE = "Apache-2.0"
LIC_FILES_CHKSUM = "file://LICENSE;md5=e3fc50a88d0a364313df4b21ef20c29e"

SRCREV = "996c3778b14936c26b49e30f8dbb4933cb2df49a"
SRC_URI = "git://github.com/Concast/libucresolv.git"
PV = "git:${SRCPV}"
S = "${WORKDIR}/git"
DEPENDS = ""

PR = "r1"
inherit cmake pkgconfig
EXTRA_OECMAKE = "-DBUILD_TESTING=OFF -DBUILD_YOCTO=true"

FILES_${PN} += " \
    ${libdir}/* \
    "

FILES_SOLIBSDEV = ""
INSANE_SKIP_${PN} += "dev-so"

do_install_append() {
    install -d ${D}/usr/include/bits/types
    install -D -m 0644 ${S}/include/wcsnbs/bits/types/__mbstate_t.h ${D}${includedir}/bits/types/__mbstate_t.h
}

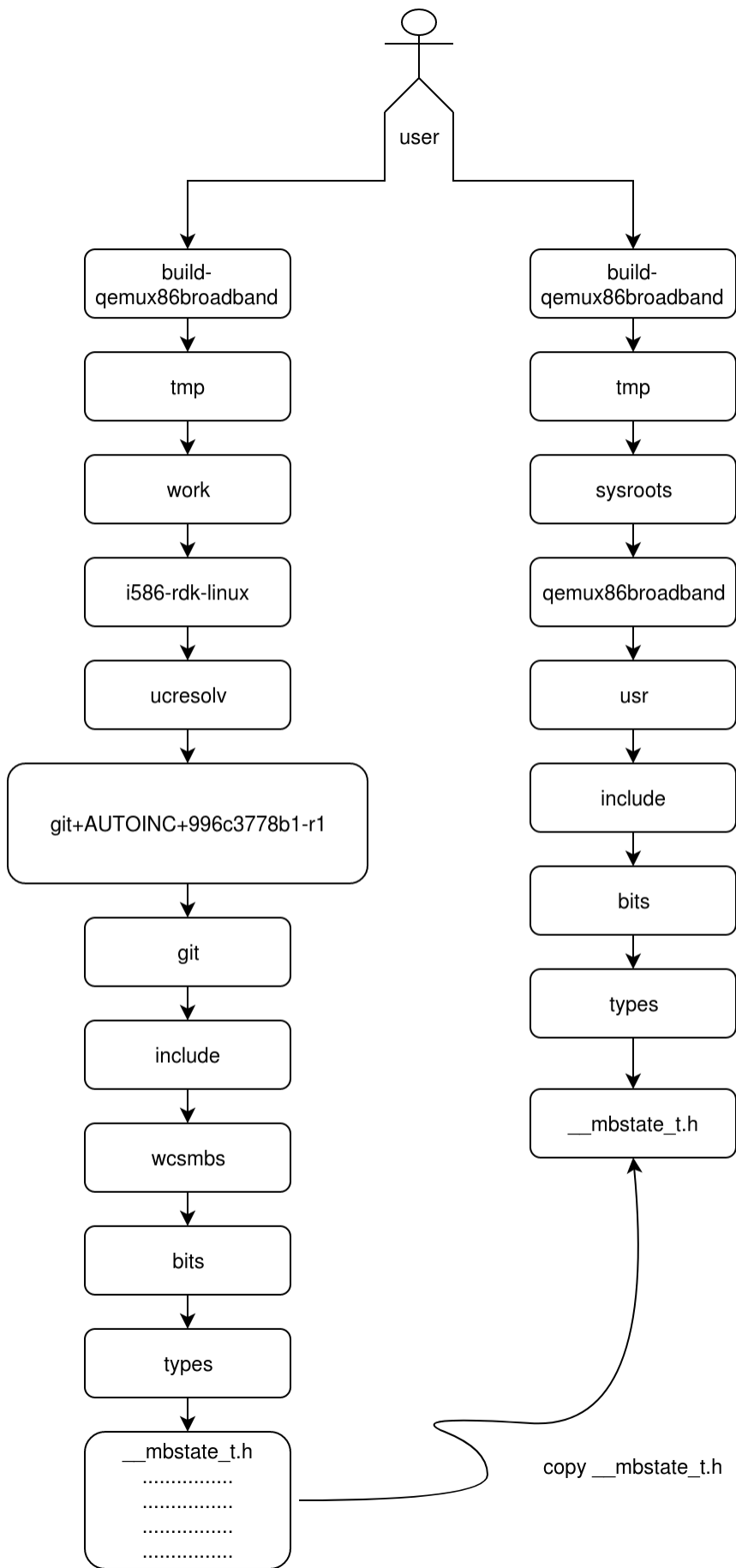
```

Modified

Patch file for changes in ucresolv_1.0.bb attached below:

[ucresolv_1.0.patch](#)

Path for changes in ucresolv_1.0.bb file:



3.1.3. Error 3

```
In file included from ../../git/debugfs/./misc/create_inode.c:19:0:
| /usr/include/unistd.h:1110:9: note: previous declaration of 'copy_file_range' was here
| ssize_t copy_file_range(int __infd, __off64_t *__pinoff,
| ^~~~~~
| Makefile:412: recipe for target 'create_inode.o' failed
| make[2]: *** [create_inode.o] Error 1
| make[2]: *** Waiting for unfinished jobs....
| gcc -c -I. -I../lib -I../git/lib -isystem/home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/sysroots/x86_64-linux/usr/include -isystem/home
| /amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/sysroots/x86_64-linux/usr/include -O2 -pipe -DHAVE_CONFIG_H -I../git/debugfs/./e2fsck -
| DDEBUGFS ../git/debugfs/xattr.c -o xattr.o
| make[2]: Leaving directory '/home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/e2fsprogs-native/1.43-r1/build
| /debugfs'
| Makefile:399: recipe for target 'all-progs-recursive' failed
| make[1]: *** [all-progs-recursive] Error 1
| make[1]: Leaving directory '/home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/e2fsprogs-native/1.43-r1/build'
| Makefile:334: recipe for target 'all' failed
| make: *** [all] Error 2
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Emu_Feb3/build-qemux86broadband/tmp/work/x86_64-linux/e2fsprogs-
| native/1.43-r1/temp/log.do_compile.21571)
| ERROR: Task (virtual:native:/home/amrita/Desktop/Emu_Feb3/openembedded-core/meta/recipes-devtools/e2fsprogs/e2fsprogs_1.43.bb:do_compile)
| failed with exit code '1'
```

Solution:

Change copy_file_range to copy_file_chunk in x86_64-linux/e2fsprogs-native/1.43-r1/git/misc/create_inode.c

Pictorial representation of changes in create_inode.c file:

```
static errcode_t copy_file_range(ext2_filsys fs, int fd, ext2_file_t e2_file,
                                off_t start, off_t end, char *buf,
                                char *zerobuf)
{
    off_t off, bpos;
    ssize_t got, blen;
    unsigned int written;
    char *ptr;
    errcode_t err = 0;

    for (off = start; off < end; off += COPY_FILE_BUFLen) {
#ifdef HAVE_PREAD64
        got = pread64(fd, buf, COPY_FILE_BUFLen, off);
#elif HAVE_PREAD
        got = pread(fd, buf, COPY_FILE_BUFLen, off);
#else
        got = my_pread(fd, buf, COPY_FILE_BUFLen, off);
#endif
        if (got < 0) {
            err = errno;
            goto fail;
        }
        for (bpos = 0, ptr = buf; bpos < got; bpos += fs->blocksize) {
            blen = fs->blocksize;
            if (blen > got - bpos)
                blen = got - bpos;
            if (memcmp(ptr, zerobuf, blen) == 0) {
                ptr += blen;
                continue;
            }
        }
    }
}
```

Original



```
static errcode_t copy_file_chunk(ext2_filsys fs, int fd, ext2_file_t e2_file,
                                 off_t start, off_t end, char *buf,
                                 char *zerobuf)
{
    off_t off, bpos;
    ssize_t got, blen;
    unsigned int written;
    char *ptr;
    errcode_t err = 0;

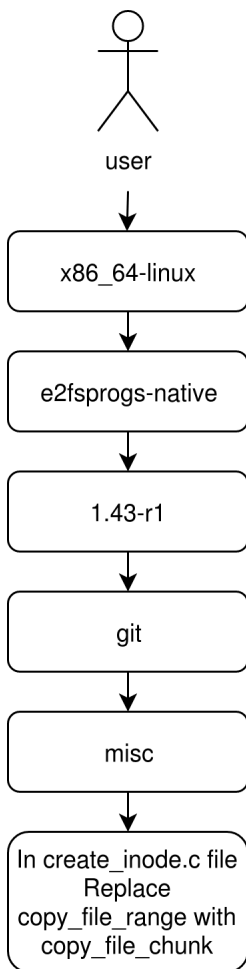
    for (off = start; off < end; off += COPY_FILE_BUFLen) {
#ifdef HAVE_PREAD64
        got = pread64(fd, buf, COPY_FILE_BUFLen, off);
#elif HAVE_PREAD
        got = pread(fd, buf, COPY_FILE_BUFLen, off);
#else
        got = my_pread(fd, buf, COPY_FILE_BUFLen, off);
#endif
        if (got < 0) {
            err = errno;
            goto fail;
        }
        for (bpos = 0, ptr = buf; bpos < got; bpos += fs->blocksize) {
            blen = fs->blocksize;
            if (blen > got - bpos)
                blen = got - bpos;
            if (memcmp(ptr, zerobuf, blen) == 0) {
                ptr += blen;
                continue;
            }
        }
    }
}
```

Modified

Patch file for changes in create_inode.c attached below:

[create_inode.patch](#)

Path for changes in create_inode.c file:



3.2. Error Messages during bitbake for Raspberry Pi and solutions.

3.2.1. Error 1

```

/home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/memfd.c:40:12: error:
static declaration of 'memfd_create' follows non-static declaration
| static int memfd_create(const char *name, unsigned int flags)
| ^~~~~~
| In file included from /usr/include/x86_64-linux-gnu/bits/mman-linux.h:115:0,
| from /usr/include/x86_64-linux-gnu/bits/mman.h:45,
| from /usr/include/x86_64-linux-gnu/sys/mman.h:41,
| from /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/include/ysyemu/os-
| posix.h:29,
| from /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/include/qemu/osdep.h:
| 104,
| from /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/memfd.c:28:
| /usr/include/x86_64-linux-gnu/bits/mman-shared.h:46:5: note: previous declaration of 'memfd_create' was here
| int memfd_create (const char * __name, unsigned int __flags) __THROW;
| ^~~~~~
| /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/rules.mak:59: recipe for
| target 'util/memfd.o' failed
| make: *** [util/memfd.o] Error 1
| make: *** Waiting for unfinished jobs....
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux
| /qemu-native/2.7.0-r1/temp/log.do_compile.19600)
| ERROR: Task (virtual: native:/home/amrita/Desktop/Rpi\_Jan31/openembedded-core/meta/recipes-devtools/qemu/qemu\_2.7.0.bb:do\_compile) failed with
| exit code '1'
  
```

Solution:

Removed static keyword in function int memfd_create in file /x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/memfd.c

Pictorial representation of changes in memfd.c file:

```
#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#ifdef CONFIG_MEMFD
#include <sys/memfd.h>
#ifdef CONFIG_LINUX
#include <sys/syscall.h>
#include <asm/unistd.h>

static int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U
#endif
#endif
```

Original

→

```
#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#ifdef CONFIG_MEMFD
#include <sys/memfd.h>
#ifdef CONFIG_LINUX
#include <sys/syscall.h>
#include <asm/unistd.h>

int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

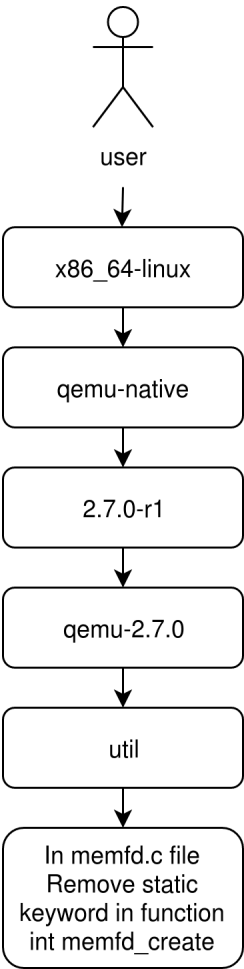
#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U
#endif
#endif
```

Modified

Patch file for changes in memfd.c attached below:

[memfd.patch](#)

Path for changes in memfd.c file:



3.2.2. Error 2

```

/usr/include/gconv.h:26:36: fatal error: bits/types/__mbstate_t.h: No such file or directory
| #include <bits/types/__mbstate_t.h>
| ^
| compilation terminated.
| src/CMakeFiles/ucresolv.shared.dir/build.make:137: recipe for target 'src/CMakeFiles/ucresolv.shared.dir/res_send.c.o' failed
| make[2]: *** [src/CMakeFiles/ucresolv.shared.dir/res_send.c.o] Error 1
| make[2]: Leaving directory '/home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/cortexa7t2hf-neon-vfpv4-rdk-linux-gnueabi/ucresolv/git+AUTOINC+996c3778b1-r1/build'
| CMakeFiles/Makefile2:90: recipe for target 'src/CMakeFiles/ucresolv.shared.dir/all' failed
| make[1]: *** [src/CMakeFiles/ucresolv.shared.dir/all] Error 2
| make[1]: Leaving directory '/home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/cortexa7t2hf-neon-vfpv4-rdk-linux-gnueabi/ucresolv/git+AUTOINC+996c3778b1-r1/build'
| Makefile:132: recipe for target 'all' failed
| make: *** [all] Error 2
| WARNING: exit code 2 from a shell command.
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/cortexa7t2hf-neon-vfpv4-rdk-linux-gnueabi/ucresolv/git+AUTOINC+996c3778b1-r1/temp/log.do_compile.6585)
ERROR: Task (/home/amrita/Desktop/Rpi_Jan31/meta-rdk-ext/recipes-support/ucresolv/ucresolv_1.0.bb:do_compile) failed with exit code '1'

```

Solution:

Copy `__mbstate_t.h` file from `cortexa7t2hf-neon-vfpv4-rdk-linux-gnueabi/ucresolv/git+AUTOINC+b58d49e165-r1/git/include/wcsnbs/bits/types` and put it in `build-raspberrypi-rdk-broadband/tmp/sysroots/raspberrypi-rdk-broadband/usr/include/bits/types/`

Patch file for changes in [ucresolv_1.0.bb](#) attached below:

```

SUMMARY = "ucresolv library"
DESCRIPTION = "Recipe to build library for uclibc resolver missing features"
HOMEPAGE = "https://github.com/Concast/libucresolv"

LICENSE = "Apache-2.0"
LIC_FILES_CHKSUM = "file://LICENSE;md5=e3fc50a8bd0a364313df4b21ef20c29e"

SRCREV = "996c3778b14936c26b49e30f8dbb4933cb2df49a"
SRC_URI = "git://github.com/Concast/libucresolv.git"
PV = "git:${SRCREV}"
S = "${WORKDIR}/git"
DEPENDS = ""

PR = "r1"
Inherit::cnake pkgconfig
EXTRA_OECMAKE = "-DBUILD_TESTING=OFF -DBUILD_YOCTO=true"

FILES_${PN} += " \
    ${libdir}/"

FILES_SOLIBSDEV = ""
INSANE_SKIP_${PN} += "dev-so"

```

Original



```

SUMMARY = "ucresolv library"
DESCRIPTION = "Recipe to build library for uclibc resolver missing features"
HOMEPAGE = "https://github.com/Concast/libucresolv"

LICENSE = "Apache-2.0"
LIC_FILES_CHKSUM = "file://LICENSE;md5=e3fc50a8bd0a364313df4b21ef20c29e"

SRCREV = "996c3778b14936c26b49e30f8dbb4933cb2df49a"
SRC_URI = "git://github.com/Concast/libucresolv.git"
PV = "git:${SRCREV}"
S = "${WORKDIR}/git"
DEPENDS = ""

PR = "r1"
Inherit::cnake pkgconfig
EXTRA_OECMAKE = "-DBUILD_TESTING=OFF -DBUILD_YOCTO=true"

FILES_${PN} += " \
    ${libdir}/"

FILES_SOLIBSDEV = ""
INSANE_SKIP_${PN} += "dev-so"

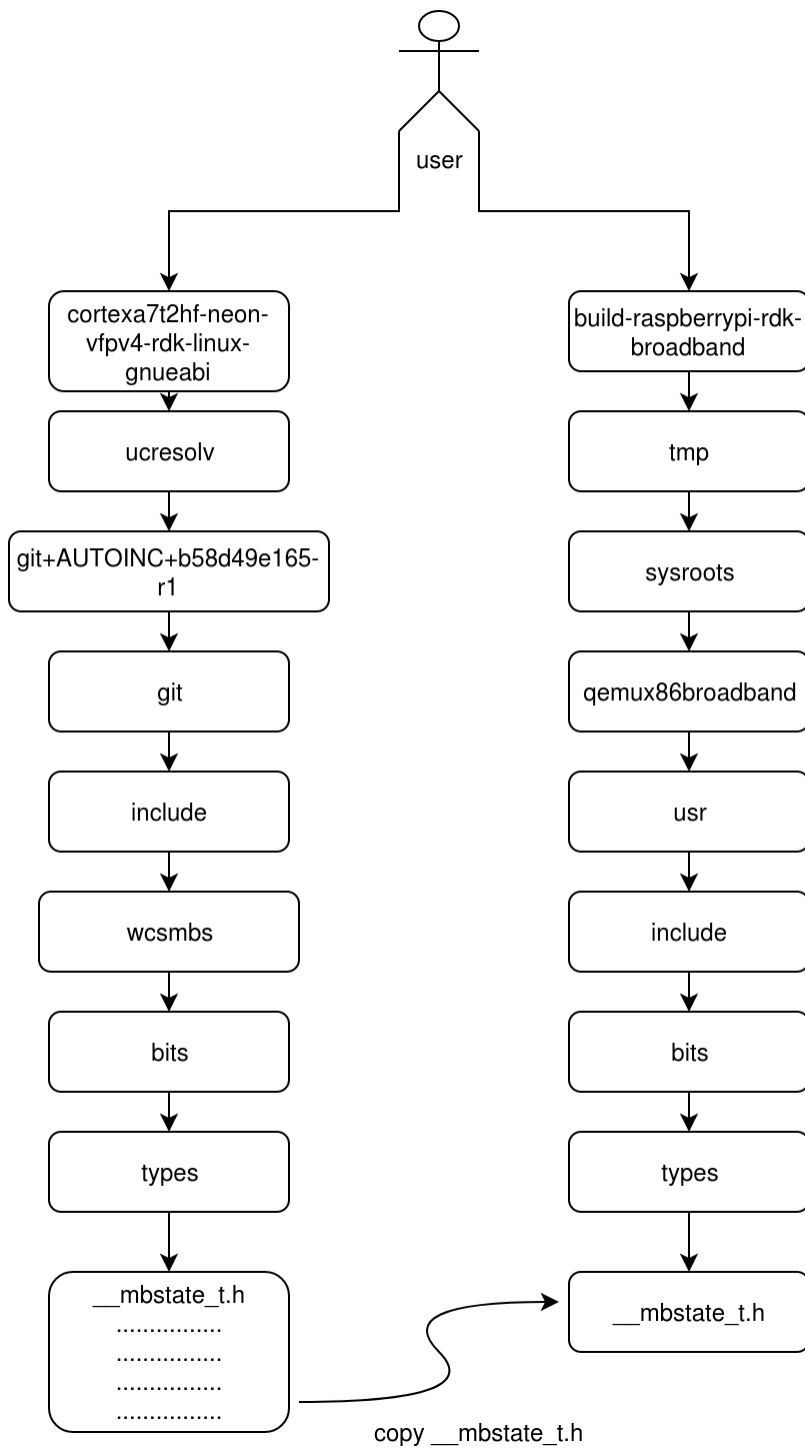
do_install_append() {
    install -d ${D}/usr/include/bits/types
    install -D -m 0644 ${S}/include/wcsnbs/bits/types/__mbstate_t.h ${D}${includedir}/bits/types/__mbstate_t.h
}

```

Modified

[ucresolv_1.0.patch](#)

Path for changes in [ucresolv_1.0.bb](#) file:



3.2.3. Error 3

```

In file included from ../git/debugfs/./misc/create_inode.c:19:0:
| /usr/include/unistd.h:1110:9: note: previous declaration of 'copy_file_range' was here
| ssize_t copy_file_range(int __infd, __off64_t *__pinoff,
| ^~~~~~
| Makefile:412: recipe for target 'create_inode.o' failed
| make[2]: *** [create_inode.o] Error 1
| make[2]: *** Waiting for unfinished jobs....
| make[2]: Leaving directory '/home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/e2fsprogs-native/1.43-r1/build
| /debugfs'
| Makefile:399: recipe for target 'all-progs-recursive' failed
| make[1]: *** [all-progs-recursive] Error 1
| make[1]: Leaving directory '/home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux/e2fsprogs-native/1.43-r1/build'
| Makefile:334: recipe for target 'all' failed
| make: *** [all] Error 2
| WARNING: exit code 1 from a shell command.
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Rpi_Jan31/build-raspberrypi-rdk-broadband/tmp/work/x86_64-linux
| /e2fsprogs-native/1.43-r1/temp/log.do_compile.11514)
| ERROR: Task (virtual:native:/home/amrita/Desktop/Rpi_Jan31/openembedded-core/meta/recipes-devtools/e2fsprogs/e2fsprogs_1.43.bb:do_compile)
| failed with exit code '1'

```

Solution:

Change copy_file_range to copy_file_chunk in x86_64-linux/e2fsprogs-native/1.43-r1/git/misc/create_inode.c

Pictorial representation of changes in create_inode.c file:

```

static errcode_t copy_file_range(ext2_filsys fs, int fd, ext2_file_t e2_file,
                                off_t start, off_t end, char *buf,
                                char *zerobuf)
{
    off_t off, bpos;
    ssize_t got, blen;
    unsigned int written;
    char *ptr;
    errcode_t err = 0;

    for (off = start; off < end; off += COPY_FILE_BUFLen) {
#ifdef HAVE_PREAD64
        got = pread64(fd, buf, COPY_FILE_BUFLen, off);
#elif HAVE_PREAD
        got = pread(fd, buf, COPY_FILE_BUFLen, off);
#else
        got = my_pread(fd, buf, COPY_FILE_BUFLen, off);
#endif
        if (got < 0) {
            err = errno;
            goto fail;
        }
        for (bpos = 0, ptr = buf; bpos < got; bpos += fs->blocksize) {
            blen = fs->blocksize;
            if (blen > got - bpos)
                blen = got - bpos;
            if (memcmp(ptr, zerobuf, blen) == 0) {
                ptr += blen;
                continue;
            }
        }
    }
}

```

Original



```

static errcode_t copy_file_chunk(ext2_filsys fs, int fd, ext2_file_t e2_file,
                                 off_t start, off_t end, char *buf,
                                 char *zerobuf)
{
    off_t off, bpos;
    ssize_t got, blen;
    unsigned int written;
    char *ptr;
    errcode_t err = 0;

    for (off = start; off < end; off += COPY_FILE_BUFLen) {
#ifdef HAVE_PREAD64
        got = pread64(fd, buf, COPY_FILE_BUFLen, off);
#elif HAVE_PREAD
        got = pread(fd, buf, COPY_FILE_BUFLen, off);
#else
        got = my_pread(fd, buf, COPY_FILE_BUFLen, off);
#endif
        if (got < 0) {
            err = errno;
            goto fail;
        }
        for (bpos = 0, ptr = buf; bpos < got; bpos += fs->blocksize) {
            blen = fs->blocksize;
            if (blen > got - bpos)
                blen = got - bpos;
            if (memcmp(ptr, zerobuf, blen) == 0) {
                ptr += blen;
                continue;
            }
        }
    }
}

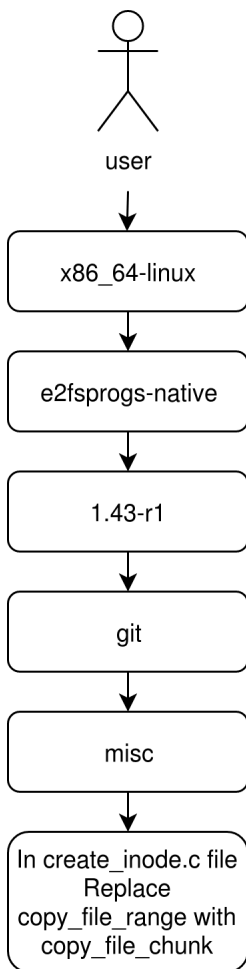
```

Modified

Patch file for changes in create_inode.c attached below:

[create_inode.patch](#)

Path for changes in create_inode.c file:



3.3. Special Considerations

Error

```

/home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/rules.mak:59: recipe for
target 'util/memfd.o' failed
| make: *** [util/memfd.o] Error 1
| make: *** Waiting for unfinished jobs....
| /home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c: In function
'follow_path':
| /home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c:126:5:
warning: this 'if' clause does not guard... [-Wmisleading-indentation]
| if (!cursor->populated_entries)
| ^~
| /home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/path.c:128:9: note: ...
this statement, but the latter is misleadingly indented as if it were guarded by the 'if'
| cursor = *source;
| ^~~~~~
| WARNING: /home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux/qemu-native/2.7.0-r1/temp/run.do_compile.
8435:1 exit 1 from 'exit 1'
| ERROR: Function failed: do_compile (log file is located at /home/amrita/Desktop/Emu_Feb3/build-raspberrypi3-64-rdk-broadband/tmp/work/x86_64-linux
/qemu-native/2.7.0-r1/temp/log.do_compile.8435)
ERROR: Task (virtual:native:/home/amrita/Desktop/Emu_Feb3/openembedded-core/meta/recipes-devtools/qemu/qemu_2.7.0.bb:do_compile) failed with
exit code '1'

```

Solution:

Removed 1. #ifdef CONFIG_MEMFD 2. #include <sys/memfd.h> 3. #elif defined CONFIG_LINUX and added 1. #include <sys/mman.h> 2. #if defined CONFIG_LINUX && !defined CONFIG_MEMFD in /x86_64-linux/qemu-native/2.7.0-r1/qemu-2.7.0/util/memfd.c

Pictorial representation of changes in memfd.c file:

```

#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#ifdef CONFIG_MEMFD
#include <sys/memfd.h>
#elif defined CONFIG_LINUX
#include <sys/syscall.h>
#include <asm/unistd.h>

int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U

```

Original



```

#include "qemu/osdep.h"
#include <glib/gprintf.h>
#include "qemu/memfd.h"

#include <sys/mman.h>
#ifdef CONFIG_LINUX && !defined CONFIG_MEMFD
#include <sys/syscall.h>
#include <asm/unistd.h>

int memfd_create(const char *name, unsigned int flags)
{
    #ifdef __NR_memfd_create
        return syscall(__NR_memfd_create, name, flags);
    #else
        return -1;
    #endif
}

#ifdef MFD_CLOEXEC
#define MFD_CLOEXEC 0x0001U
#endif

#ifdef MFD_ALLOW_SEALING
#define MFD_ALLOW_SEALING 0x0002U

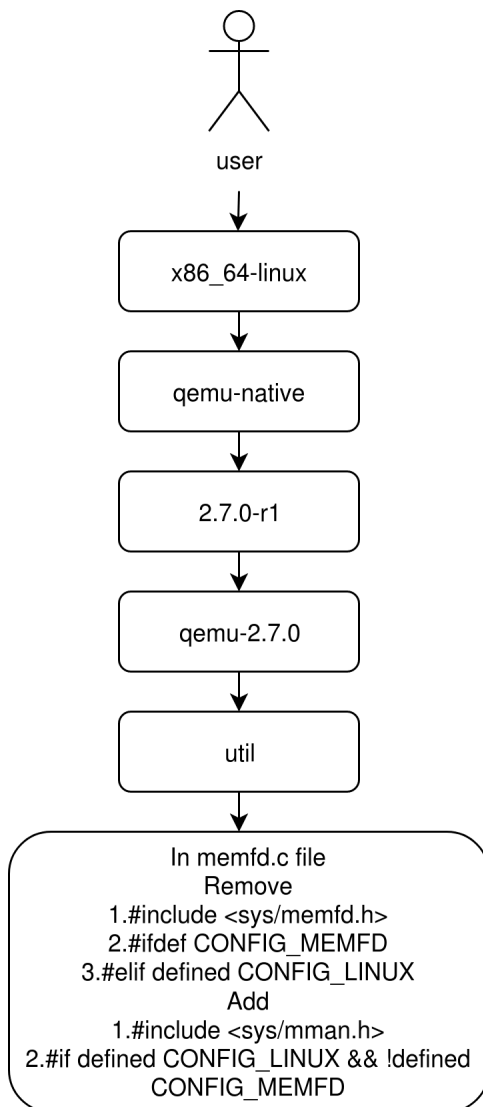
```

Modified

Patch file for changes in memfd.c attached below:

[memfd.patch](#)

Path for changes in memfd.c file:



4. Support

Contact	Organization	Phone	Email	Role
Rajkumar Narayanan	L&T Technology Services	Nil	rajkumar.narayanan@lts.com	Program Manager