# Linux port for Xtensa

## Phase 1

Goal: linux mainline contains the latest linux-xtensa updates, builds and works.

- compilable with latest GCC
- overlays to cover: FSF, dc232b, more TBD
- tests to pass: builds, boots, LTP
- boards to focus on: ISS, ML605
- configurations: UP, linux-next specific, more TBD

## Plan

- Prepare for linux-next participation
  - [2/3] Make mainline build for ARCH=xtensa in defconfig, allnoconfig, allmodconfig
    - [+] fix remaining issues with allmodconfig
    - why there's no simdisk in the mainline?
    - qemu needs proper handling for guest ioctls triggered via simcalls
  - [+] Make built images work (qemu, FSF)
- [+] Build userspace
- Automated build/test scripts
  - [+] build/test status/logs
  - expect script to run LTP
- Analyse reference tree
  - proper bugfixes
  - new cores (dc233c, test_hifi_c3, s*)
  - new platforms (lx*, ml605, s*)
  - SMP and its fixes
  - XCC fixes
- Issues

## Work items

#### SMP support

#### Support for Tensilica FPGA boards

- [+] serial
- [+] ethernet
- [+] FLASH
- [-] audio

In the mainline:

```
0d456ba xtensa: add support for the XTFPGA boards
5584b4d xtensa: add XTFPGA DTS
```

#### Atomics (arch/xtensa/include/asm/atomic.h, bitops.h, spinlock.h) and check for S32C1I

Merged in the eb0a9bf31fdbcee9463c0f42fbf4a292ef149a7d, pick up from individual files.

Done, in the mainline:

```
2f6ea6a xtensa: display s32c1i feature flag in cpuinfo
733536b xtensa: save and restore scompare1 SR on kernel entry
c622b29 xtensa: initialize atomctl SR
28570e8 xtensa: add trap_set_handler function
0027312 xtensa: add s32c1i sanity check
219b1e4 xtensa: add s32c1i-based atomic ops implementations
e5a9f6a xtensa: add s32c1i-based bitops implementations
71872b5 xtensa: add s32c1i-based spinlock implementations
599bf77 xtensa: fix mb and wmb definitions
```

#### TIE coprocessors

23ae3f723c8996d47ef205e98cb7732bbde4775f

#### Highmem

#### Interrupt management

Done, in the mainline:

```
2206d5d xtensa: add IRQ domains support
```

#### Medium level interrupts in less hacky way

489fb47c75772e3a41ef3e988eb0c0e512592085

Draft on xtensa-fixes branch.

#### Device trees support

Done, in the mainline:

```
da844a8 xtensa: add device trees support
```

### MMU v3

Draft on xtensa-fixes branch.

### ptrace (support latest GDB)

617244763e19a4eebb4fabe41ba56eb1ccbdb049, 23ae3f723c8996d47ef205e98cb7732bbde4775f, ff1b10f85a1176d1eb8df433434b717f6f0841d4, a2b61af3328025d6069e8bf9ff36f5288e11dba9

### Support for building with XCC

### simdisk

1a955825662fa378d447b91485d9fe2438124b0a, 8bcbc3adb5c5bfdbd96078c1e68916be859c832d

### Various fixes made for debuggability

### oprofile

8c502ca703956e56bf191774e4169752f0f71c8e, 7dd1d39e70769f2dd7a6a508d58b187ed8d1cb95

### Generic kernel_thread & friends

Done, in the mainline:

```
3306a72 xtensa: switch to generic kernel_thread()
f0a1bf0 xtensa: switch to generic kernel_execve()
dc241f2 xtensa: switch to generic sys_execve()
```

### Cache aliasing aware mmap

Draft on xtensa-fixes branch.

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