

Work Report for Jinzai Solution Inc.

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17S3Q_LinuxUpstream_I/O_add_Aug(Wo)

1.1 Develop fault injection driver for I2C busses

1.1.1 List of patches posted to public mailing lists

[PATCH] i2c: gpio: add fault injector

1.1.2 Link to public git tree topic branches containing patches posted

<https://git.kernel.org/pub/scm/linux/kernel/git/wsa/linux.git/log/?h=renesas/topic/i2c-fault-injection>

1.1.3 Copy of pull request with the branches merge candidates

Hi Geert,

here is a topic branch for renesas-drivers introducing the I2C fault injection feature. Because of the DTS addition, it is based on renesas-drivers/master. Please let me know if there is more suitable base and I will happily rebase it for you.

Kind regards,

Wolfram

The following changes since commit 91538653fd513606684cae7b58972966b0279ca3:

media: rcar-csi2: Fix section mismatch from rcar_csi2_probe()
(2017-08-16 19:26:39 +0200)

are available in the git repository at:

```
git://git.kernel.org/pub/scm/linux/kernel/git/wsa/linux.git
    renesas/topic/i2c-fault-injection
```

for you to fetch changes up to 4051abe643e3995ec4c7e42d1e27793bbf36cedc:

```
i2c: gpio: add fault injector (2017-08-25 17:24:38 +0200)
```

Wolfram Sang (2):

```
    arm64: dts: salvator-common: add GPIO based I2C bus
    i2c: gpio: add fault injector
```

```
Documentation/i2c/gpio-fault-injection          |  54 ++++++++
arch/arm64/boot/dts/renesas/salvator-common.dtsi |  11 +++
drivers/i2c/busses/Kconfig                      |   8 ++
drivers/i2c/busses/i2c-gpio.c                   | 112 +++++
4 files changed, 185 insertions(+)
create mode 100644 Documentation/i2c/gpio-fault-injection
```

1.1.4 Link to the wiki pages containing the test procedure

<http://elinux.org/Tests:I2C-fault-injection>

1.1.5 Test results summary

As described in the elinux wiki page, it could be demonstrated that this topic branch is capable of introducing faults to a connected I2C bus. Especially the SDA stuck low case from which driver should recover from with the help of the Linux I2C core. Also, other cases like SCL stuck low could be enforced.

In addition to the mandatory Salvator-X board, additional testing has been done on the Lager board. It could also be shown that also HW solutions to the SDA stuck low problem are already in place. Either as an external device (LTC4313 on the Salvator-X) or internally in I2C clients (like DA9xxx devices on Lager). Devices which leave SDA low also have been identified (AK4643 on Lager). For implementing the bus recovery feature later, the latter one seems to be the preferred setup because no HW solution will interfere.