XMC402 10GB Ethernet Driver for VxWorks 6.9.2 (Service Pack 2, B3C01 Platform BSP)

1.Revision History

Date	Version	Author	Remarks
17 December 2012	01	Jochen Beier	Initial Version

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3. Integration of XMC402 module in VxWorks

The X540-AT2 NIC is not supported in default VxWorks vxbTei82598End driver, so minor modifications in the network driver must be done before using the XMC402 module. Support for the X540-AT2 NIC will be added by WindRiver with VxWorks-6.9.2 Service Pack 3. Prior to Service Pack 3 support for the X540-AT2 must be added to the TEI driver source with the following modification.

3.1 vxbTei82598End network driver modifications

- Define missing device ID 0x1528 in vxbTei82598End.h

```
#define INTEL_DEVICEID_X540AT2                0x1528
```

- Add device ID for the X540-AT2 NIC in vxbTei82598End.c

```
LOCAL struct vxbPciID teiPciDevIDList[] =
    {
        /* { devID, vendID } */
       ...
       { INTEL_DEVICEID_X540AT2, INTEL_VENDORID },
       ...
    };
```

- Set device ID to 82599 device type in vxbTei82598End.c

```
* Assume 82598 device, unless we detect otherwise. */

    pDrvCtrl->teiDevType = TEI_DEVTYPE_82598;

    if (devId == INTEL_DEVICEID_82599_SFP ||
        ...
        ...
-->     devId == INTEL_DEVICEID_X540AT2 ||
        devId == INTEL_DEVICEID_82599_T3_LOM)
        pDrvCtrl->teiDevType = TEI_DEVTYPE_82599;
```

3.2 VxWorks image components

Following components must be included in vxWorks image (vxprj or workbench build) for using the XMC402 module.

- INCLUDE_PCI_BUS
- INCLUDE_PCI_BUS_SHOW
- INCLUDE_PCI_BUS_AUTOCONF
- DRV_VXBEND_TEI82598

3.3 Optimizing network speed performance

To achieve better performance of 10Gbit network speed the default vxWorks send and receive buffer sizes should be increased to 4096 KB, also jumbo frames should be used. Using SMP vxWorks image, Hyperthreading should be disabled in uEFI. With UP vxWorks image CPU turbo should be enabled in uEFI and included in kernel config.

- Increase IPNET_SOCK_DEFAULT_SEND_BUFSIZE and IPNET_SOCK_DEFAULT_SEND_BUFSIZE in workbench project (kernel configuration) to 4096 KB or use "vxprj parameter set" for vxprj image build.

- Enable jumbo frames in hwconf.c for tei0 and tei1

```
VXB_INST_PARAM_OVERRIDE sysInstParamTable[] =
       {
       { "i82801SmbK", 0, "maxRetries", VXB_PARAM_INT32, {(void *) SMB_MAX_RETRIES} },
       { "tei", 0, "jumboEnable", VXB_PARAM_INT32, {(void *)1} },
       { "tei", 1, "jumboEnable", VXB_PARAM_INT32, {(void *)1} },
       { "ipmiDevK", 0, "initDelay", VXB_PARAM_INT32, {(void *) IPMI_INIT_DELAY} },
       { NULL, 0, NULL, VXB_PARAM_END_OF_LIST, {(void *)0} }
       };
```

3.4 Example for UP/SMP vxprj image build after driver modifications

- Example UP image.

```
       vxprj create kontron_b3c01 gnu UP/vxWorks_image
       vxprj bundle add UP/vxWorks_image/vxWorks_image.wpj BUNDLE_STANDALONE_SHELL
```

```
vxprj component remove UP/vxWorks_image/vxWorks_image.wpj INCLUDE_PC_CONSOLE
vxprj component add UP/vxWorks_image/vxWorks_image.wpj INCLUDE_PCI_BUS
INCLUDE_PCI_BUS_SHOW INCLUDE_PCI_BUS_AUTOCONF DRV_VXBEND_TEI82598 INCLUDE_CPU_TURBO
vxprj file add UP/vxWorks_image/vxWorks_image.wpj vxbTei82598End.c
vxprj parameter set UP/vxWorks_image/vxWorks_image.wpj
IPNET_SOCK_DEFAULT_SEND_BUFSIZE '"4194304"'
vxprj parameter set UP/vxWorks_image/vxWorks_image.wpj
IPNET_SOCK_DEFAULT_RECV_BUFSIZE '"4194304"'
vxprj build UP/vxWorks_image/vxWorks_image.wpj
```

- Example vxWorks SMP image.

```
vxprj create kontron_b3c01 gnu SMP/vxWorks_image -smp
vxprj bundle add SMP/vxWorks_image/vxWorks_image.wpj BUNDLE_STANDALONE_SHELL
vxprj component remove SMP/vxWorks_image/vxWorks_image.wpj INCLUDE_PC_CONSOLE
vxprj component add SMP/vxWorks_image/vxWorks_image.wpj INCLUDE_PCI_BUS
INCLUDE_PCI_BUS_SHOW INCLUDE_PCI_BUS_AUTOCONF DRV_VXBEND_TEI82598
vxprj file add SMP/vxWorks_image/vxWorks_image.wpj vxbTei82598End.c
vxprj parameter set SMP/vxWorks_image/vxWorks_image.wpj
IPNET_SOCK_DEFAULT_SEND_BUFSIZE '"4194304"'
vxprj parameter set SMP/vxWorks_image/vxWorks_image.wpj
IPNET_SOCK_DEFAULT_RECV_BUFSIZE '"4194304"'
vxprj build SMP/vxWorks_image/vxWorks_image.wpj
```