CoAP -13

From TinyOS Wiki
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TinyOS CoAP (-13)

Contents

This page describes how to setup the TinyOS CoAP (-13) implementation based on libcoap (http://sourceforge.net/projects/libcoap/) and uses the TinyOS blip-rpl stack for UDP communication.

You can find the previous version of this page at: CoAP_-03.

Installation instructions

Compile libcoap and examples

```
cd $TOSROOT/tools
./Bootstrap
./configure
make

cd $TOSROOT/tools/tinyos/c/coap
./configure --with-tinyos
```

The code has been tested on TelosB nodes only, yet. The sample implementation depends on TelosB sensors.

Compile and install CoapBlip application

To install CoapBlip on a mote, attach the mote via USB and run the following set of commands:

```
cd $TOSROOT/apps/CoapBlip
make telosb blip coap install,3 bsl,/dev/ttyUSB0
```

Setting up PppRouter and ppp connection

To install the PppRouter application for IPv6 support on the second attached mote, execute

```
cd $TOSROOT/apps/PppRouter
```

and install the PppRouter:

```
make telosb blip install bsl,/dev/ttyUSB1
```

Next, start the ppp connection by executing

```
sudo pppd debug passive noauth nodetach 115200 /dev/ttyUSB1 nocrtscts nocdtrcts lcp-echo-interval 0 noccp noip ipv6 ::23,::2
```

After entering the sudo password, a similar output should be printed on your screen:

```
using channel 1
Using interface ppp0
Connect: ppp0 <--> /dev/ttyUSB1
sent [LCP ConfReq id=0x1 <asyncmap 0x0> <magic 0xc33c412b> <pcomp> <accomp>]
rcvd [LCP ConfRej id=0x1 <magic 0xc33c412b> <pcomp>]
sent [LCP ConfReq id=0x2 <asyncmap 0x0> <accomp>]
rcvd [LCP ConfAck id=0x2 <asyncmap 0x0> <accomp>]
rcvd [LCP ConfReq id=0x3 <mru 1280> <asyncmap 0x0> <accomp>]
sent [LCP ConfAck id=0x3 <mru 1280> <asyncmap 0x0> <accomp>]
sent [IPV6CP ConfReq id=0x1 <addr fe80::0000:0000:0000:0023>]
rcvd [IPV6CP ConfReq id=0x1 <addr fe80::0000:0000:0000:0000>]
sent [IPV6CP ConfNak id=0x1 <addr fe80::0000:0000:0000:0024>]
rcvd [IPV6CP ConfReq id=0x2 <addr fe80::0000:0000:0000:0000>]
sent [IPV6CP ConfNak id=0x2 <addr fe80::757d:cee8:dcad:b877>]
rcvd [IPV6CP ConfReq id=0x3 <addr fe80::0000:0000:0000:0024>]
sent [IPV6CP ConfAck id=0x3 <addr fe80::0000:0000:0000:0024>]
sent [IPV6CP ConfReq id=0x1 <addr fe80::0000:0000:0000:0023>]
rcvd [IPV6CP ConfAck id=0x1 <addr fe80::0000:0000:0000:0023>]
local  LL address fe80::0000:0000:0000:0023
remote LL address fe80::0000:0000:0000:0024
Script /etc/ppp/ipv6-up started (pid 23284)
Script /etc/ppp/ipv6-up finished (pid 23284), status = 0x0
```

Open a new terminal and run

```
sudo ifconfig ppp0 add fec0::100/64
```

The ppp connection is now established.

Run CoAP example client

To run the CoAP example client and request a resource from the server execute the following commands:

```
cd $TOSROOT/tools/tinyos/c/coap/examples
./coap-client coap://[fec0::3]/<URI>
```

whereas <URI> specifies the resource you want to access.

For TelosB motes, currently the following resources are supported and can be enabled/disabled in the Makefile of the CoAP application:

Flag	URI	GET	PUT	POST	DELETE	Comments
#WITHOUT_WELLKNOWN	.well-known/core	X	-	-	-	Core Link Format of URIs
COAP_RESOURCE_DEFAULT		X	X	X	X	Resource for POST and DELETE support
COAP_RESOURCE_TEMP	/st	X	-	-	-	Temperature
COAP_RESOURCE_HUM	/sh	X	-	-	-	Humidity
COAP_RESOURCE_VOLT	/sv	X	-	-	-	Voltage
COAP_RESOURCE_ALL	/r	X	-	-	-	Temperature + Humidity

						+ Voltage
COAP_RESOURCE_LED	/l	X	X	-	-	LEDs
COAP_RESOURCE_ROUTE	/rt	X	-	-	-	Routing table
COAP_RESOURCE_ETSI_IOT_VALIDATE	/validate	X	X	-	-	Resource which varies
COAP_RESOURCE_ETSI_IOT_SEGMENT	/seg1/seg2/seg3	X	-	-	-	Long path resource
COAP_RESOURCE_ETSI_IOT_SEPARATE	/separate	X	X	-	-	Resource with separate response
COAP_RESOURCE_ETSI_IOT_LOCATION_QUERY	/location-query	X	-	X	-	Resource accepting location query parameters
COAP_RESOURCE_ETSI_IOT_QUERY	/query	X	-	-	-	Resource accepting query parameters
COAP_RESOURCE_ETSI_IOT_LARGE	/large	X	-	-	-	Large resource
COAP_RESOURCE_ETSI_IOT_OBSERVE	/obs	X	X	-	-	Observable resource which changes every 5 seconds
COAP_RESOURCE_ETSI_IOT_MULTI_FORMAT	/multi-format	X	-	-	-	Resource that exist in different content-formats

Note: Due to restricted memory capacities on TelosB motes, you may not be able to enable all resources at the same time!

All ETSI_IOT resources were tested during the 2nd CoAP Plugtest. Further information can be found in the test description (http://www.etsi.org/plugtests/CoAP/About_CoAP.htm)

As an example for accessing the LED resource, the following commands can be used:

GET request:

```
./coap-client coap://[fec0::3]/l
```

PUT request:

```
./coap-client -m put coap://[fec0::3]/l -e 7
```

This should turn on all three Leds on the node.

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- This page has been accessed 42,145 times.