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IEEE WCNC 2015 - Track 3- Mobile and Wireless Networks

#312 (1570023793): eXtend Collection Tree Protocol



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Title	Only the chairs (ieeewcnc2015-track3-mobileandwirelessnetworks-chairs@edas.info) can edit	eXtend Collection Tree Protocol						
Abstract	Only the chairs (ieeewcnc2015-track3-mobileandwirelessnetworks-chairs@edas.info) can edit	<p>In this work, we propose eXtend Collection Tree Protocol (XCTP), a routing protocol that is an extension of the Collection Tree Protocol (CTP). CTP is the de-facto standard collection routing protocol for Wireless Sensor Network (WSN). CTP creates a routing tree to transfer data from one or more sensors to a root (sink) node. But, CTP does not create the reverse path between the root node and sensors. This reverse path is important, for example, for feedback commands or acknowledgment packets. XCTP enable communication in both ways: sink to node and node to sink. XCTP accomplishes this task by exploring the CTP control plane packets. XCTP requires low storage states and very low additional overhead in packets. With the reverse path, it is possible to implement reliable transport layer protocols for Wireless Sensor Network (WSN). Thus, we designed Transport Automatic Piggyback Protocol (TAP2), a transport protocol with Automatic Repeat-reQuest (ARQ) error- control on top of XCTP. We implemented these protocols on TinyOS and evaluated on TOSSIM. We compared XCTP with CTP, Routing Protocol for low power and lossy networks (RPL), and Ad hoc On Demand Distance Vector (AODV) protocols. We conducted scalability and stress tests, evaluating them with different loads and number of nodes. Our results shows that XCTP is more reliable then CTP, delivering 100% of the packets. XCTP sends fewer control packets than RPL. XCTP is faster to recovery from network failures and also stores fewer state than AODV, thus being efficient and agile.</p>						
Keywords	Only the chairs (ieeewcnc2015-track3-mobileandwirelessnetworks-chairs@edas.info) can edit	Sensor Network; Routing; Wireless Communication						
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Reviews

3 Reviews

Review 1 (Reviewer F)

Relevance and Timeliness	Technical Content and Scientific Rigour	Novelty and Originality	Quality of Presentation
Excellent. (5)	Solid work of notable importance. (4)	Some interesting ideas and results on a subject well investigated. (3)	Readable, but revision is needed in some parts. (3)

Strong Aspects (Comments to the author: What are the strong aspects of the paper?)

Interestingly the authors point out that there are no reliable protocol for many-to-one communications and, propose the protocol XCTP that implements bidirectional communications. Indeed, the protocol is presented as an extension of CTP protocol.

The work makes sense as well as the problem considered in the paper. I feel that their solution that make use of different routing table for each direction makes also sense and is a good choice. Indeed, realistic communications are barely bidirectional.

Weak Aspects (Comments to the author: What are the weak aspects of the paper?)

Some aspects of the protocol remains unclear and probably the paper would gain if the presentation can be improved. For instance, the authors refers endlessly to the control plane, but what it is exactly?

The relationships CTP are not clear either. For instance the topology changes occur only in the XCTP and CTP implements its own mechanism?

Recommended Changes (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

minor but frequent typos

introduction: then -> than
sensors nodes -> sensor nodes
update e delete -> update and delete
the the hand -> the hand

for a few instances

Review 2 (Reviewer D)

Relevance and Timeliness	Technical Content and Scientific Rigour	Novelty and Originality	Quality of Presentation
Good. (4)	Solid work of notable importance. (4)	Significant original work and novel results. (4)	Well written. (4)

Strong Aspects (Comments to the author: What are the strong aspects of the paper?)

XCTP enables communication in both ways: root to node and node to root. XCTP accomplishes this task by exploring the CTP control plane packets. XCTP requires low storage states and very low additional overhead in packets.

Weak Aspects (Comments to the author: What are the weak aspects of the paper?)

This work is solid, and there is no weak aspect in my views.

Recommended Changes (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

Contribution part in introduction needs the feature of the protocol and the problem you have solved. It's not just what you have done.

Review 3 (Reviewer C)

Relevance and Timeliness	Technical Content and Scientific Rigour	Novelty and Originality	Quality of Presentation
Acceptable. (3)	Solid work of notable importance. (4)	Significant original work and novel results. (4)	Substantial revision work is needed. (2)

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