



Pentagon Reports: Fast. Definitive. Complete.

- [Home](#)
- [About Us](#)
- [Contact Us](#)
- [View Cart](#)
- [My Account](#)
- [FAQ](#)

username

LOGIN

[New Account »](#)
[Forgot Password?](#)

chaff

GO

[Advanced Search »](#)

[Communications](#) » [Radio Communications](#)

Timing-based Localization of In-Band Wormhole Tunnels in MANETs

Authors: [Jinsub Kim](#); [Dan Sterne](#); [Rommie Hardy](#); [Roshan K Thomas](#); [Lang Tong](#); [CORNELL UNIV ITHACA NY](#)

Abstract: The problem of localizing in-band wormhole tunnels in MANETs is considered. In an in-band wormhole attack, colluding attackers use a covert tunnel to create the illusion that two remote network regions are directly connected. This apparent shortcut in the topology attracts traffic which the attackers can then control. To identify the nodes participating in the attack, it is necessary to determine the path through which victims' traffic is covertly tunneled. This paper begins with binary hypothesis testing, which tests whether a suspected path is carrying tunneled traffic. The detection algorithm is presented and evaluated using synthetic voice over IP (VoIP) traffic generated in a network testbed. After that, we consider multiple hypothesis testing to find the most likely tunnel path among a large number of candidates. We present a tunnel path estimation algorithm and its numerical evaluation using Poisson traffic. A main feature of the proposed algorithms is their robustness against the presence of **chaff** packets (possibly introduced to avoid detection), packet loss caused by unreliable wireless links, and clock skew at different nodes.

Adobe PDF - \$18.95

Printed Format - \$20.95

ADD TO CART

Please check the box for the format you wish to order.

[Shipping Terms](#)
[About Electronic Delivery](#)

[Email This Abstract](#)

Limitations: APPROVED FOR PUBLIC RELEASE
Pages: 13
Report Date: Mar 2010
Contract Number: DAAD19-01-2- 0011
Report Number: A184655

Keywords relating to this report:

- » [ALGORITHMS](#)
- » [CHAFF](#)
- » [COMMUNICATIONS NETWORKS](#)
- » [COVERT OPERATIONS](#)
- » [DETECTION](#)
- » [ESTIMATES](#)
- » [NODES](#)
- » [NUMERICAL ANALYSIS](#)
- » [PATHS](#)
- » [POISSON DENSITY FUNCTIONS](#)
- » [TEST AND EVALUATION](#)
- » [TUNNELS](#)
- » [VOICE COMMUNICATIONS](#)
- » [WIRELESS LINKS](#)

[« Back to search](#)