









## 7. Conclusion

We have proposed a new key management paradigm to enable send and leave broadcast to remote cooperative groups without relying on a fully trusted third party. Our scheme has been proven secure in the standard model. A thorough complexity analysis and extensive experiments show that our proposal is also efficient in terms of computation overhead and communication. These features render our scheme a promising solution to the group-oriented communication with access control in various types of ad hoc networks.

## References

- [1] Q.Wu, J. Domingo-Ferrer, and U. González-Nicolás, "Balanced trustworthiness, safety and privacy in vehicle-to-vehicle communications," IEEE Trans. Veh. Technol., vol. 59, no. 2, pp. 559–573, Feb. 2010.
- [2] L. Zhang, Q. Wu, A. Solanas, and J. Domingo-Ferrer, "A scalable robust authentication protocol for secure vehicular communications," IEEE Trans. Veh. Technol., vol. 59, no. 4, pp. 1606–1617, May 2010.
- [3] J. H. Cheon, N.-S. Jho, M.-H. Kim, and E. S. Yoo, "Skipping, cascade, and combined chain schemes for broadcast encryption," IEEE Trans. Inf. Theory, vol. 54, no. 11, pp. 5155–5171, Nov. 2008.
- [4] Y.-M. Huang, C.-H. Yeh, T.-I. Wang and H.-C. Chao, "Constructing Secure group communication over wireless ad hoc networks based on a virtual subnet model," IEEE wireless Commun., vol. 14, no. 5, pp. 71–75, Oct. 2007.
- [5] Y. Zhang and Y. Fang, "ARSA: An attack-resilient security architecture for multi-hop wireless mesh networks," IEEE J. Sel. Areas Commun, vol(1). 24, no. 10, pp. 1916–1928, Oct. 2006.
- [6] M. Naor and B. Pinkas, "Efficient trace and revoke schemes," in Proc. 4th FC, 2001, vol. 1962, pp. 1–20.
- [19] D. Boneh, C. Gentry, and B. Waters, "Collusion resistant broadcast encryption with short ciphertexts and private keys," Adv. Cryptol., vol. 3621, CRYPTO'05, LNCS, pp. 258–275, 2005.
- [7] Y. Amir, Y. Kim, C. Nita-Rotaru, J. L. Schultz, J. Stanton, and G. Tsudik, "Secure group communication using robust contributory key agreement," IEEE Trans. Parallel Distrib. Syst., vol. 15, no. 5, pp. 468–480, May 2004.
- [8] J. Lotspiech, S. Nusser, and F. Pestoni, "Anonymous trust: Digital rights management using broadcast encryption," Proc. IEEE, vol. 92, no. 6, pp. 898–909, Jun. 2004.
- [9] D. Halevi and A. Shamir, "The LSD broadcast encryption scheme," Adv. Cryptol., vol. 2442, CRYPTO'02, LNCS, pp. 47–60, 2002.
- [10] J. Snoeyink, S. Suri, and G. Varghese, "A lower bound for multicast key distribution," Proc. IEEE INFOCOM, pp. 422–431, 2001.
- [11] C. K. Wong, M. Gouda, and S. Lam, "Secure group communications using key graphs," IEEE/ACM Trans. Netw., vol. 8, no. 1, pp. 16–30, Feb. 2000.
- [12] M. Steiner, G. Tsudik, and M. Waidner, "Key agreement in dynamic peer groups," IEEE Trans. Parallel Distrib. Syst., vol. 11, no. 8, pp. 769–780, Aug. 2000.
- [13] M. Abdalla, Y. Shavitt, and A. Wool, "Key management for restricted multicast using broadcast encryption," IEEE/ACM Trans. Netw., vol. 8, no. 4, pp. 443–454, Aug. 2000.
- [14] M. Waldvogel, G. Caronni, D. Sun, N. Weiler, and B. Plattner, "The versa key framework: Versatile group key management," IEEE J. Sel. Areas Commun., vol. 17, no. 9, p. 1614–1631, Sep. 1999.
- [15] B. M. Macq and J.-J. Quisquater, "Cryptology for digital TV broadcasting," Proc. IEEE, vol. 83, no. 6, pp. 944–957, Jun. 1995.
- [16] M. Burmester and Y. Desmedt, "A secure and efficient conference key distribution system," Adv. Cryptol., vol. 950, EUROCRYPT'94, LNCS, pp. 275–286, 1995.
- [17] A. Fiat and M. Naor, "Broadcast encryption," Adv. Cryptol., vol. 773, CRYPTO'93, LNCS, pp. 480–491, 1993.
- [18] I. Ingemarsson, D. T. Tang, and C. K. Wong, "A conference on key distribution system," IEEE Trans. Inf. Theory, vol. 28, no. 5, pp. 714–720, Sep. 1982.

## Author Profile



**Mr. P. Hari Krishna** received B. Tech. degree in Computer Science and Engineering from JNTUK University, in 2010. Currently he is doing M. Tech. in Prakasam Engineering College, from JNTUK University, Kakinada, India

**K. V. Srinivasa Rao** received M.TECH degree in Computer Science and Engineering from JNTUA University, and currently he is working as an Associate Professor, Department of CSE in Prakasam Engineering College, Kandukur, India.