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CACHE BASED V TO V BROADCASTING THEORY TO OVERCOME THE LEVERAGES THE NETWORK IN METROPOLITAN CITIES

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Abstract

Data-driven networks support business integration to facilitate information sharing. In car communication, the program does not close and does not add old data. However, the transmission of information using TCP/IP services on the Internet and networks at high speeds is problematic in urban areas, where high speeds are prohibited or less radio frequency and less radio frequency solve. Since this is a short-term data transmission problem, this paper introduces a cargo system to store each vehicle. As a customer or as a document. Use Node to quickly move data to another address by creating another node. God a cache policy that places copies everywhere is inconsistent, distributed, and lends itself to dynamism. and a dynamic system. The performance analysis compares the proposed method with existing solutions. Examples include TCP/IP, OMNeT++, vascular methods using the SUMO simulator, and detailed city maps. Great for casual travel. Using software designed for each vehicle. Simulation result we support the proposed model based on four factors: strength of the proposed constraint, reliability, and reliability. Adaptation to varying traffic loads, low RSU and Internet resource usage, and cache efficiency. Related publications on the distribution of information in the automotive industry and the information industry suggest methods related to the automotive industry and methods for distributing local market files to the town of the city. Also, for each cache, we verify the algorithm that was last used. This book is from the upcoming CII Internet Paradigm. The proposed protection mechanism effectively solves the common problems of congestion, short RSU radius distance, limited RSU distribution and low data rate due to TCP traffic in urban areas. An important technology in this process is online caching. Data transfer is facilitated by the cache function, which provides data transfer from bus to bus, unlike the RSU.

Keywords: Cache. P2p Network, VAN, ICN, OMNeT++.

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1. INTRODUCTION

Information-based networks (ICNs) are driving the development of future business networks to replace current communication modelsICN aims to implement efficient and reliable information sharing by providing a communication service platform that can be used in special systems such as peer-to-peer (P2P). -peer) to share personal information on websites. ICN uses network caching to deliver powerful and efficient media services. Network caching has become a special area of research in the context of the ICN [4the use of security in automotive communication beyond initial safety applications such as driving safety and driving performance multimedia systems and content that meet more than 90% of the requirements. Internet traffic after years Furthermore, data services cause delays to applications and insecure vehicle systems that consider using sensor networks instead of 4G-LTE internet services. The infrastructure and traffic is a strategy related to the development of the next generation of the Internet, because the ICN strategy is compatible with the needs of traffic systems, which are important to self-awareness before traveling by car Section. As is commonly believed store chain concept. In this article, we consider the management of the network used in file sharing companies in urban markets, where cities, as homes and businesses, are important places to use of new technology and the benefit of the public. Send a message. And provide a better experience. We discuss the scope, issues, and related programs, and we propose a web privacy policy in the next section.

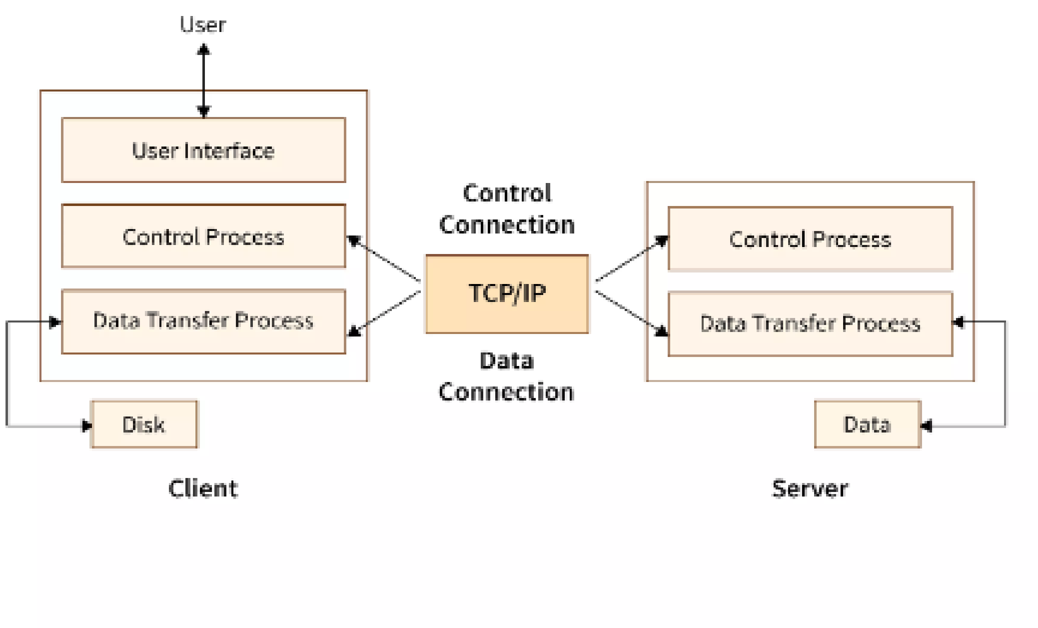

Figure 1: TCP/IP file sharing block diagram

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2. LITERATURE SURVEY

For vehicle communication, the automotive industry has developed many different radio accesses Technologies such as DSRC (dedicated short range communication) and WAVE (wireless access Vehicular Environments, IEEE 802.11p) for vehicle and automotive communications. vehicle (V2V)).). And RSU vehicle communication (R2V) [6, 7, 11, 12]. The term "short range" in the DSRC means Communication takes place over a distance of hundreds of meters, which is much shorter than the cell and WiMAX services generally support it. This is the way cars normally operate, they can exchange information in the form of mobile communications. Although the main reason behind implementing DSRC is to enable communication applications, DSRC can be used for general business and recreational purposes, as well as defense. Although DSRC security applications are currently limited, they are expected to increase in the future. Figure 1 shows the main scenarios for TCP/IP-based communication between road traffic units (RSUs) and Internet traffic and unsecured applications. RSUs are important components that connect the Internet to vehicles. In this context, the RSU infrastructure provides a useful and unique way to transfer data to the vehicle. Many solutions can work within the current TCP/IP paradigm. The encryption method (encrypted storage) shown in [6] is used to transfer large and small data and allows for faster transfer of large data on the bus. This paper [8] discusses content downloading in vehicular networks using hotspot deployment, V2V transmission and broadcast frequency optimization. Although the TCP/IP protocol is recommended for bus-to-bus communications on bus systems [7, 11], the main limitation is the infrastructure required to assign global IP addresses [7]. , that's enough. It was not possible to provide permanent equipment support due to the inability to connect to RSU equipment, for example building stability and radio noise due to the amount of radio transmission, as shown in Figure 1, and due to the slow growth of the road network. So far, there is little literature on the use of ICN in VANETs (Vehicle Ad Hoc Networks), only a few examples [5, 7, 12]. [7], Wang et al. develop learning concepts through assessment, procedures, data processing, etc. The ICNow (Information-centric Networking on Wheels) approach proposed in [5] emphasizes detail, physicality and user and needs. A project called Content-Centric Vehicular Network [12] focused on content naming, search engines, and early research, and ICN decided to make better use of TCP/IP systems.

3. PROPOSED SYSTEM ANALYSIS:

Our work in this paper is based on the network integration process shown in Figure 2, which tries to solve the problem of filling people's houses with air to create a space. the city. The purpose of the plan is to achieve a high data transfer rate and reduce RSU access and network traffic by increasing commercial communication. , each car has its own space. V2V communication in a hidden network overcomes the effect of local protection and airspace limitation compared to R2V communication to improve the data exchange speed. V2V communication in the network cache overcomes the effects of internal and limited air coverage compared to R2V communication to improve data transfer speed. We use deposit policies and Leave Copy Everywhere (LCE) policies on the bus network. In addition, we propose at least a general replacement algorithm (LRU)

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for each slot based on vehicle motion characteristics and regular data exchange. in a business environment. Each vehicle not only acts as a request token, but also serves as a network buffer to process requests from other vehicles. To support the proposed web-based caching method, a simulation model was developed within the framework of OMNeT++ [14] and Veins [15], using real city and street maps validated by SUMO [16] and OpenStreetMap [17]. Our planning software prioritizes the traffic of each vehicle; therefore, a good routing system will make the performance analysis results of these items more reliable.

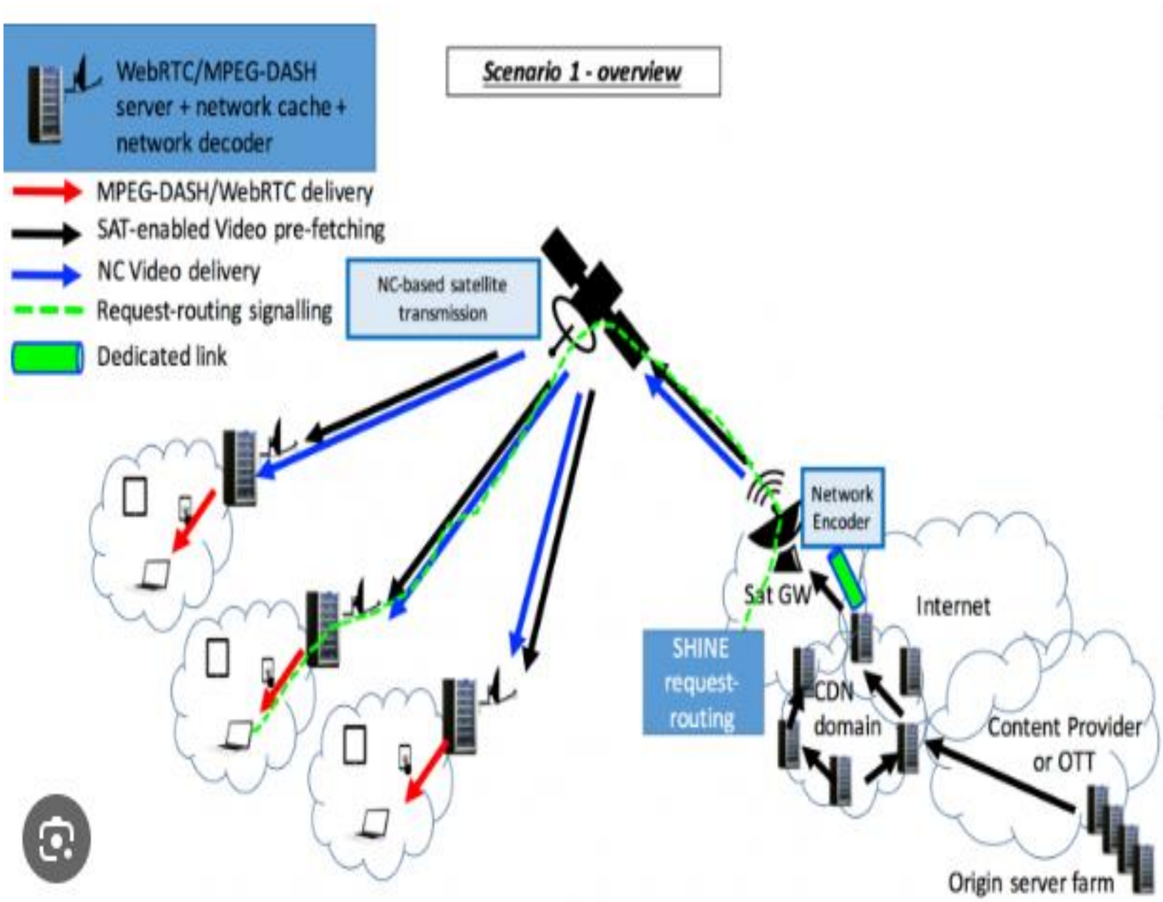

Figure 2: Cache based file delivery system with in-Network model

Data transmission is a common problem in mobile networks, such as data throttling in urban areas where large buildings block or slow down data transmission. On the other hand, other technical issues, such as the RSU connection required for global distribution of IP addresses, short coverage, and access points (AP), led to progress. Increasing the use of RSUs, which some articles consider as an alternative solution, can improve data transmission [8, 20], although there is a complex relationship between the number of RSUs and financial costs [21, 22].

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Adding more RSUs can increase the data transfer rate, but the improvement is not limited to the DSRC feature of the environment. The difficulty of solving the above problems, starting from the existing problems, motivated us to find new solutions for the ICN parade. To overcome the investment cost of comprehensive RSU and build an efficient data transmission system, this article discusses other solutions to facilitate data transmission between vehicles.

The framework should enable sliding scale solutions to create faster and more robust repositories of shared content. One way to do this is through network caching. In addition, we recommend applying the last replacement algorithm (LRU) to all caches. In business, issues related to local markets influence society. The LRU cache algorithm makes sense based on the location of the link. In the bus library, shown in Figure 2, each bus plays two roles, not only the user saves data, but also an online cache that responds to interest in other vehicles and forwards messages to them. This repository stores nearby media information and serves as a hub for active connections to RSU resources without facing data sharing rate limitations and reducing dependency on RSUs. In the first phase, the RSU downloads data from the server to complete the request.

The content came from the Automotive Network. Second, data is sent from the RSU to the network bus. A small percentage of vehicles receive and store vehicle communication records from the RSU; These buses are members of group 1. Other buses that do not accept Group 1 cache lines are shown in Figure (1): When a node downloads a file from the RSU, the file is cached. Group 2 safety rules are listed in paragraphs (2) and (3). Dual port downloads files in two ways. One method is shown in (2): if node x receives a file from node n in group 1, the file is saved. Another method is shown in (3): node x requests a file from node pair 2 to node pair 1. Instead, the file is stored on each node. The above function applies to all nodes shown in Figure 3**.**

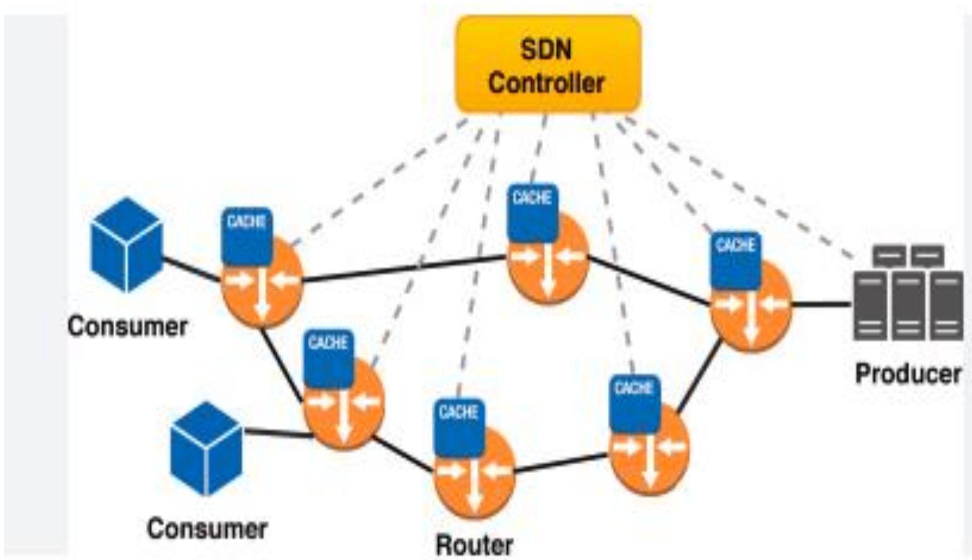

Figure 3: file transmission for in-network caching based scheme.

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3.1. Robustness evaluation:

Strategic network security systems ensure security in both: whether there is a problem or not. On the other hand, bandwidth affects and slows down data transfer in existing TCP/IP systems. The scheme fixes the stability of the structure under tension.

3.2. Evaluation of reliability and scalability:

Simulation test results on different vehicles show good and stable results Change advanced data regardless of whether the building is safe or not. However, TCP/IP This is not a good process for the above process, especially when it comes to products. Also, Heavy vehicle performance proves that this program is suitable for polishing.

3.3. Less Utilization of RSU and Network

In our test setup, the more RSUs we change, the more RSUs we use. If you rely more on RSUs, How much network usage do you use? The simulation results show the performance of the proposal the system is inferior to TCP/IP based systems. The safety net holds most of the information transfer based on bus-to-bus communication instead of RSU-to-bus communication; However, in adults system, data transfer is completely dependent on data transfer on the RSU bus.

3.4. Estimated Deposit Efficiency:

Caching functionality that replaces most of the RSU bus increases data transfer speeds Information communication between buses. To demonstrate this, we provide a quantitative analysis of V2V. We evaluate the performance of the cache by performing transmission and R2V communication under different traffic loads. Bus from Kobe, Japan passes through a large city called Sannomiya, view map of the actual city Download from OpenStreetMap and download 100 short market files scattered among vehicles in the area.

The demo was created using OMNeT++ 4.4.1 (online simulator) and Veins 3.0 (online vehicle simulator). SUMO 0.21.0 (road traffic simulator). We also create routes for each vehicle using our own development. Software that provides practical methods. This traffic model increases the reliability of simulation results certificate. By increasing the power, the RSU position and vehicle movement can be achieved. It can be controlled in light, medium and heavy traffic.

4. CONCLUSION

In this paper, we review the literature on information sharing in business partnerships and social media and present an integrated approach to partnerships for the composition of relationships that back up everything for personal business purposes. file in open mode. We also want the new algorithm to be used everywhere. This definition comes from ICN's Next Generation Internet Concept. The online payment method effectively solves the problems caused by heavy construction, short RSU radio, small RSU group and heavy TCP/IP traffic in the city.

The technology behind this package is web hosting. Changing data is the cache function communicates between buses, not RSU-RSU. A performance evaluation has taken place network caching using TCP/IP systems and advanced simulation tools (OMNeT++) and Veins. And SUMO and cards. Each car uses a different method, but the software is sensitive.

The simulation results support the process from four aspects: pipeline stability, reliability and flexibility under different traffic conditions, low consumption of RSU and network resources, and good memory. Deep web software and traffic can open up new trends in urban information sharing.

References

1) B. Ahlgren, C. Dannewitz, C. Imbrenda, D. Kutscher, and B. Ohlman, "A survey of information-centric networking," *IEEE Communications Magazine*, vol. 50, no. 7, pp. 26–36, 2012.

2) J. Choi, J. Han, E. Cho, T. T. Kwon, and Y. Choi, "A survey on content-oriented networking for efficient content delivery," *IEEE Communications Magazine*, vol. 49, no. 3, pp. 121–127, 2011.

3) V. Jacobson, D. K. Smetters, J. D. Thornton, M. F. Plass, N. H. Briggs, and R. L. Braynard, "Networking named content," in *Proceedings of the 5th International Conference on Emerging Networking Experiments and Technologies (CoNEXT '09)*, pp. 1– 12, ACM, Rome, Italy, 2009.

4) I. Psaras, W. K. Chai, and G. Pavlou, "In-network cache management and resource allocation for information-centric networks," *IEEE Transactions on Parallel and Distributed Systems*, vol. 25, no. 11, pp. 2920–2931, 2014.

5) F. Bai and B. Krishnamachari, "Exploiting the wisdom of the crowd: localized, distributed information-centric VANETs," *IEEE Communications Magazine*, vol. 48, no. 5, pp. 138–146, 2010.

6) M. Sathiamoorthy, A. G. Dimakis, B. Krishnamachari, and F. Bai, "Distributed storage codes reduce latency in vehicular networks," *IEEE Transactions on Mobile Computing*, vol. 13, no. 9, pp. 2016–2027, 2014.

7) L. Wang, R. Wakikawa, R. Kuntz, R. Vuyyuru, and L. Zhang, "Data naming in vehicle-to-vehicle communications," in *Proceedings of the IEEE Workshop on Emerging Design Choice in Name-Oriented Networking Workshop (INFOCOM '12)*, pp. 328–333, Orlando, Fla, USA, March 2012.

8) F. Malandrino, C. Casetti, C.-F. Chiasserini, and M. Fiore, "Optimal content downloading in vehicular networks," *IEEE Transactions on Mobile Computing*, vol. 12, no. 7, pp. 1377–1391, 2013.

9) Z. Li and G. Simon, "Time-shifted TV in content centric networks: the case for cooperative in-network caching," in *Proceedings of the IEEE International Conference on Communications (ICC '11)*, pp. 1–6, Kyoto, Japan, June 2011.

10) Cisco, *The Cisco Visual Networking (VNI) Forecast 2009–2014*, Cisco, 2010.

11) J. B. Kenney, "Dedicated short-range communications (DSRC) standards in the United States," *Proceedings of the IEEE*, vol. 99, no. 7, pp. 1162–1182, 2011.

12) M. Amadeo, C. Campolo, and A. Molinaro, "Content-centric networking: is that a solution for upcoming vehicular net- works," in *Proceeding of the 9th ACM International Workshop on Vehicular Inter-Networking, Systems, and Applications (VANET '12)*, pp. 99–102, Ambleside, UK, June 2012.

13) "Reducing Environmental Footprint based on Multi-Modal Fleet management Systems for Eco-Routing and Driver Behaviour Adaptation (REDUCE)," 2014, http://cordis.europa.eu/ docs/projects/cnect/4/288254/080/delive- rables/003-D631.pdf.

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14) https://www.openstreetmap.org/.

15) https://omnetpp.org/.

16) http://veins.car2x.org/.

17) http://sumo.dlr.de/wiki/Main Page.

18) C. Sommer, D. Eckhoff, and F. Dressler, "IVC in cities: signal attenuation by buildings and how parked cars can improve the situation," *IEEE Transactions on Mobile Computing*, vol. 13, no. 8, pp. 1733–1745, 2014.

19) C. Sommer, D. Eckhoff, R. German, and F. Dressler, "A computationally inexpensive empirical model of IEEE 802.11p radio shadowing in urban environments," in *Proceedings of the 8th IEEE/IFIP Conference on Wireless On-Demand Network Systems and Services (WONS '11)*, pp. 84–90, Bardonecchia, Italy, January 2011.

20) H. Cheng, X. Fei, A. Boukerche, and M. Almulla, "*GeoCover*: an efficient sparse coverage protocol for RSU deployment over urban VANETs," *Ad Hoc Networks*, vol. 24, pp. 85–102, 2015.

21) Q. Chen, D. Jiang, and L. Delgrossi, "IEEE 1609.4 DSRC multi- channel operations and its implications on vehicle safety communications," in *Proceedings of the IEEE Vehicular Networking Conference (VNC '09)*, pp. 1–8, October 2009.

22) F. Malandrino, C. Casetti, C.-F. Chiasserini, C. Sommer, and F. Dressler, "The role of parked cars in content downloading for vehicular networks," *IEEE Transactions on Vehicular Technology*, vol. 63, no. 9, pp. 4606–4617, 2014.

23) I. Psaras, W. K. Chai, and G. Pavlou, "Probabilistic in-network caching for information-centric networks," in *Proceedings of the 2nd ICN Workshop on Information-Centric Networking*, pp. 55– 60, 2012.

24) N. Laoutaris, H. Che, and I. Stavrakakis, "The LCD interconnection of LRU caches and its analysis," *Performance Evaluation*, vol. 63, no. 7, pp. 609–634, 2006.

25) K. Cho, M. Lee, K. Park, T. T. Kwon, Y. Choi, and S. Pack, "WAVE: popularity-based and collaborative in-network caching for content-oriented networks," in *Proceedings of the IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS '12)*, pp. 316–321, Orlando, Fla, USA, March 2012.

26) S. Wang, J. Bi, and J. Wu, "Collaborative caching based on hash- routing for information-centric networking," in *Proceedings of the ACM SIGCOMM 2013 conference on Information-Centric Networking (SIGCOMM '13)*, pp. 535–536, ACM, Hong Kong, 2013.