IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 01-03

Mobility Aware Caching In D2d Networks

V.Ranjitha[1], K.Vetri Selvi[2] ,S.Kumaran M.E,(Ph.D)[3]
[1]dept, Of Electronics And Communication Engineering, Dhanalakshmi Srinivasan College Of Engineering And Technology, Tn, India.
[2]dept. Of Electronics And Communication Engineering, Dhanalakshmi Srinivasan College Of Engineering And Technology, Tn, India.
[3]assistant Professor, Dept, Of Electronics And Communication Engineering,Dhanalakshmi Srinivasan College Of Engineering And Technology,Tn,India.

Abstract : *Recent Trends Show That Internet Traffic Is Increasingly Day By Day, Which Is Accompanied By The Exponential Growth Of Traffic. To Cope With This Phenomena, Network Caching Is Introduced To Utilize The Storage Capacity Of Diverse Network Devices. In This Paper, We First Summarize Four Basic Caching Placement Strategies, I.E., Local Caching, Device-To-Device (D2d) Caching, Small Cellbase Station (Sbs) Caching And Macrocell Base Station (Mbs) Caching. However, Studies Show That So Far, Much Of The Research Has Ignored The Impact Of User Mobility. Therefore, Taking The Effect Of The User Mobility Into Consideration, We Proposes A Joint Mobility-Aware Caching And Sbs Density Placement Scheme (Ms Caching). In Addition, Differences And Relationships Between Caching And Computation Offloading Are Discussed. We Present A Design Of A Hybrid Computation Of, Which Improved Performance In Terms Of Energy Cost. Finally, We Discuss The Design Of An Incentive Mechanism By Considering Network Dynamics, Differentiated User's Heterogeneity Of Mobile Terminals In Terms Of Caching And Computing Capabilities.*
Keywords *- Caching; Computation Offloading; Human Mobility*

I. INTRODUCTION :

The Ever-Growing Number Of Smart Phones Is Producing Explosive Amounts Of Traffic In Order To Support A Wide Plethora Of Multimedia Service. However, Due To The Centralized Nature Of Mobile Network Architectures, It Is Challenging To Cope With The Rapidly Growing Mobile Traffic Along With The Limited Capacity Of The Backhaul Link. In Order To Overcome This Issue, Paradigms Called "Content-Centric Networking" (Ccn), "Named Data Networking" (Ndn) And "Content Delivery Networks" (Cdn)] Have Been Proposed To Handle Content-Dominated Internet Traffic For The Radio Access Networks (Front-Haul) And The Core Networks (Back-Haul). Furthermore, Alongside The Use Of Diverse Network Resources In Terms Of Communications, Caching And Computing Are Becoming The Emerging Techniques To Meet The Increasing Demand Of User Qoe (Quality Of Experience) In The Next Generation 5g Networks], Especially For The Internet Of Things And Healthcare Systems. In This Paper, We Consider A Heterogeneous Cellular Network, Which Consists Of A Macrocell Base Station (Mbs), Small Cell Base Stations (Sbs) (Also Called Small Cell Bs; Also Called As Pico, Pico- Or Femto-Cells As Per The Size Of The Cell) And User Terminals. The Caching And Computing Capabilities Of Sbss And User Terminals Will Facilitate Content Sharing And Computation Offloading. To Illustrate, Viral On-Line Videos Are The Kind Of Content That Mobile User Repeatedly Access, Which Leads Us To An Assumption That This Content Could Be Cached And Shared At The Edge Of The Network. Typically, Content Caching At The Edge Of The Network Can Be Classified Into Two Categories, I.E., Sbs Caching (Or Femto-Caching) The Impact Of The User Mobility On The Performance Of Caching And Computation Offloading In 5g Ultra-Dense Cellular Networks. Then, We Propose A Joint Mobility-Aware And Sbs Density Caching Placement Scheme (Ms-Caching), Taking Into Account The Impact Of User Mobility And Sbs Distribution On The Caching Placement. Moreover, We Addressed The Sbs And Mobile Devices' Computing Power, And We Summarize Four Computation Offloading Modes In 5g Ultra-Dense Cellular Networks And Propose A Hybrid Computation Offloading Strategy. Finally, We Discuss An Incentive Mechanism To Encourage Content Sharing And Computation Offloading Between Users With Heterogeneous Mobile Devices.Through Femto-Cell Access Points And Device-To-Device (D2d) Caching Assisted By User Terminals. The Contributions Of This Article Include:

_ We Propose A Novel Caching Placement Strategy Named Ms Caching. Then, We Discuss The ImpactOf The User Mobility And The Density Of Sbs On The Content Caching.

_ We Discuss The Differences And Relationships Between Caching And Computation Offloading AndPresent A Hybrid Computation Offloading Based On Mbs Computation Offloading, Sbs ComputationOffloading And D2d Computation Offloading.

_ Considering The Selfishness Of Mobile Users, We Suggest An Incentive Design Based On Network

Dynamics, Differentiated User's Qoe, And The Heterogeneity Of User Terminals In Terms Of CachingAnd Computing.

II. Caching In 5g Ultra-Dense Cellular Networks:

The Strategy Of Caching Placement By Considering The User Mobility AndSbs Density. The User Can Obtain The Requested Content Mainly Via Four Ways Listed As Follows:
_ Local Caching: When The User Requests Content, He Or She Will Firstly Examine Whether Or Not SuchContent Is Cached Locally. Once Such Content Is Confirmed In The Local Storage, The User Will Get Access To It Without Any Delay.
_ D2d Caching: If The Content Requested By The User Is Not Cached Locally, The User Will Seek SuchContent Among The Devices Within The Range Of D2d Communications. If There Exists One UserCaching Such Content, The Content Will Be Transmitted To The Target User Via D2d Communications.
_ Sbs Caching: Besides D2d Caching, If The Required Content Is Cached By One Sbs, It Will BeTransmitted To The User By The Sbs.
_ Mbs Caching: If The Content Requested By The User Cannot Be Accessed In The Aforementioned Ways, Such A Request Will Be Forwarded To The Mbs, And The Content Will Be Delivered To The User By Cellular Network Connection.

2.1:Existing System:

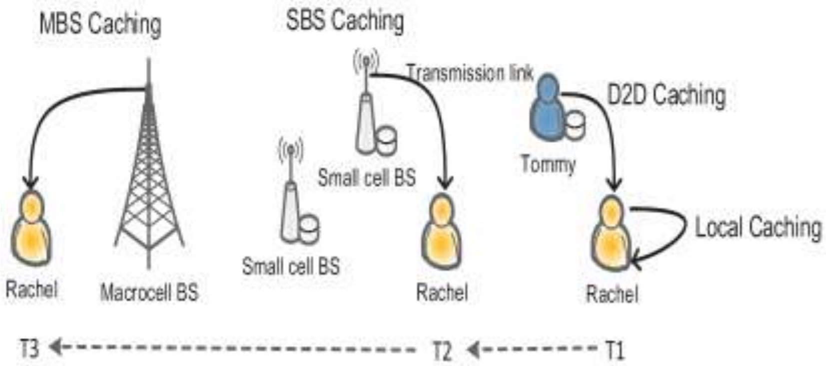
The Variety Of Network Connections Exploited By End-Users That Want The Ability To Connect To The Internet Anywhere And Anytime .User's Connectivity Experience Should Match Service Rate Requirements And Be Uniform .Users Currently Experience Different Levels Of Protection When Accessing The Internet Via Their Various Personal Devices And Network Connections, Due To Variable Network Security Conditions And Security Applications Available At Each Device. Still There Is An Issues By Designing An Architecture To Offload Security Applications From The End-User Devices To A Suitable Trusted Node .

2.2:Proposed System:

This Work Proposes A Mobility-Aware Caching Placement Strategy With The Aim Of Maximizing The Data Offloading Ratio. An Optimal Dynamic Programming (Dp) Algorithm Is Used In Improving The Performance Of Cache Concept. A Time-Efficient Greedy Algorithm Is Used In Solving The Caching Placement Problem.

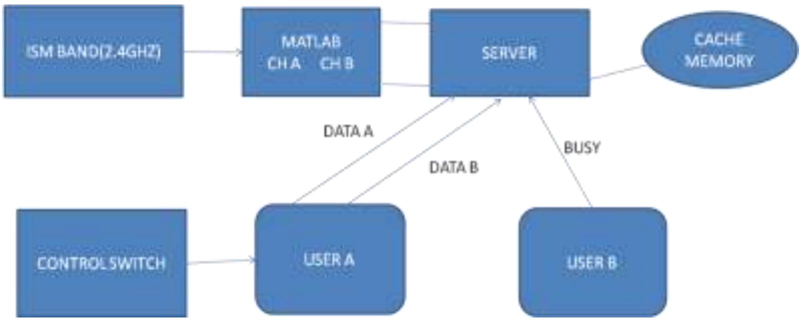
2.3:System Classifier:

Due To User Mobility, The D2d Caching Is Limited By Its Short Distance Range, Which Presents Us With The Challenge Of How To Prepare An Optimal Cache Placement Strategy, I.E., Content Caching At The Sbs And The User Terminal,And How To Maximize The Chance To Access Such Content.



III. Project Description:

We Investigate The Impact Of The User Mobility On The Performance Of Caching And Computation Offloading In 5g Ultra-Dense Cellular Networks. Then, We Propose A Joint Mobility-Aware And Sbs Density Caching Placement Scheme (Ms-Caching), Taking Into Account The Impact Of User Mobility And Sbs Distribution On The Caching Placement. Moreover, We Addressed The Sbs And Mobile Devices' Computing Power, And We Summarize Four Computation Offloading Modes In 5g Ultra-Dense Cellular Networks And Propose A Hybrid Computation Offloading Strategy. Finally, We Discuss An Incentive Mechanism To Encourage Content Sharing And Computation Offloading Between Users With Heterogeneous Mobile Devices.



A Mobility-Aware Caching Placement Strategy With The Aim Of Maximizing The Data Offloading Ratio. An Optimal Dynamic Programming (Dp) Algorithm Is Used In Improving The Performance Of Cache Concept. A Time-Efficient Greedy Algorithm Is Used In Solving The Caching Placement Problem.The Mar Advantages Are High Data Rates(Capacity And Throughput Improvement) ,Improved Spectrum Efficiency ,Reduced End To End Latency ,Seamless And Improved Coverage And Mobility.

.

REFERENCES :

[1]. J. Liu, B. Bai, J. Zhang, And K. B. Letaief, "Content Caching At The Wireless Network Edge: A Distributed Algorithm Via Brief Propagation," In Proc. Ieee Int. Conf. On Commun. (Icc), Kuala Lumpur, Malaysia,May 2016.

[2]. M. Ji, G. Caire, And A. Molisch, "Fundamental Limits Of Caching In Wireless D2d Networks," Ieee Trans. Inf. Theory, Vol. 62, No. 2, Pp.849 – 869, Feb. 2016.

[3]. X. Peng, J. Zhang, S. Song, And K. B. Letaief, "Cache Size Allocation In Backhaul Limited Wireless Networks," In Proc. Ieee Int. Conf. On Commun.(Icc), Kuala Lumpur, Malaysia, May 2016.

[4]. R. Wang, X. Peng, J. Zhang, And K. B. Letaief, "Mobility-Aware Caching For Content-Centric Wireless Networks: Modeling And Methodology," Ieee Commun. Mag., Vol. 54, No. 8, Pp. 77–83, Aug. 2016.