

Video communication with stream control transmission protocol over heterogeneous Wireless network

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Abstract:

The Multi homed video communication with SCTP over heterogeneous wireless networks. The mobile users with ubiquitous access to the Internet. The cellular networks (UMTS, HSDPA, LTE), wireless local area networks (802.11 family), and broadband wireless networks. Supported by the latest technological progress, mobile terminals are equipped with multi homing capability and enabled simultaneous access to different wireless networks. The delay-constrained video service is characterized by high transmission rate and stringent deadline. The channel resources available in wireless platforms are limited and time-varying. Stream control transmission protocol (SCTP) is a transport-layer solution recommended to enable concurrent multipath transfer (CMT) over communication networks with multi homed terminals. The existing CMT schemes mainly treat the traffic data in a content-agnostic fashion. Such scheduling approaches cannot effectively exploit the limited wireless resources to maximize the perceived quality as video streaming is characterized by complex content parameters. Developing an effective content evaluation framework is critical for enhancing video quality and network utilization. Develop an algorithm to effectively deliver multiple video streams from the sender to different receivers. In this scenario, it is important and necessary to consider the time-varying channel status of multiple communication paths. An efficient path probing scheme is desirable in the system design to accurately estimate the channel status for the decision process.

INTRODUCTION

A wireless network is any type of computer network that uses wireless data connections for connecting network nodes. Wireless networking is a method by which

homes, telecommunications networks and enterprise (business) installations avoid the costly process of introducing cables into a building. Network security consists of the policies and practices adopted to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network accessible resources. The multimedia data transmission and real-time applications which are sensitive to packet delay, packet delay variation, and packet reordering, we have proposed a novel load distribution model, which aims to minimize the difference among end-to-end delays by using locally available information. An effective model of delay-controlled load distribution becomes essential to efficiently utilize such parallel paths for multimedia data transmission and real-time applications. Concurrent multipath transfer (CMT) using stream control transmission

protocol (SCTP) exploits the multi-homing feature of mobile devices to establish associations with different access networks. a content-aware CMT (CMT-CA) solution that featured by the unequal frame level scheduling based on estimated video parameters and feedback channel status. a quality evaluation based decision making component for multi-homed video communication with SCTP over multiple networks paths. a Markov decision process (MDP) based multipath congestion control algorithm to achieve the maximum network utilization while respecting the TCP (Transmission Control Protocol) friendliness.

The Transmission Control Protocol (TCP) is one of the main protocols of the Internet protocol suite. It originated in the initial network implementation in which it complemented the Internet Protocol (IP). Therefore, the entire suite is commonly referred to as TCP/IP. TCP provides reliable, ordered, and error-checked delivery of a

stream of octets between applications running on hosts communicating by an IP network. Major Internet applications such as remote administration, communication, data exchange, file transfer rely on TCP. an unequal video frame scheduling algorithm to minimize the expected total distortion by taking advantage of differentiated transmission from source to the destination node. The SCTP control the delay time and reduce the frame Quality problem. The CMT control the traffic and reduce the traffic problem.

RELATED WORK

NETWORK FORMATION

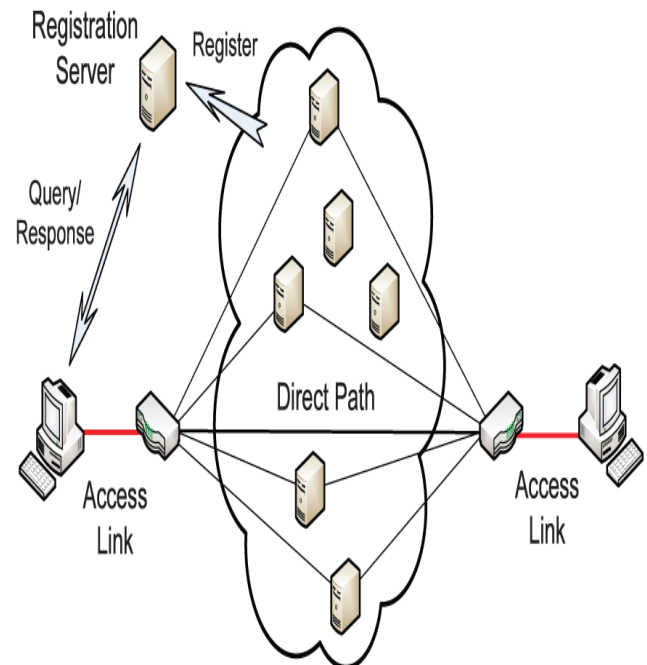
Network formation is an aspect of network science that seeks to model how a network evolves by identifying which factors affect its structure and how these mechanisms operate. NS2 is an open –source even driven similar in computer communication network. It is a discrete event simulator for networking research. It simulates wired and wireless network. NS2 uses Tcl as its scripting language. Create the nodes using NS2 tool and form the network group. Establish the connection between all nodes. Spectrum allocation is the division of the electromagnetic spectrum into radio frequency bands. Then allocate the spectrum and connection range of all network nodes.

VIDEO ENCODER

The Video Encoding is the process of converting Digital video files from one format to another. Encoder is a device, circuit, software program, algorithm or person that converts information from one format or code to another for the purpose of the standardization, speed or compressions. The delay constrained Video service is characterized by high transmission rate and reduce the delay time. Transmission rate is the rate at which information is processed by a transmission facility. The Video are converted into the small size of frame values. In Video and Animation frame are individual picture in a sequence of images. Then the frames are converted into streaming process for the transaction. The streaming process for the transaction using stream control transmission protocol. SCTP is a type of mobility management for IP based networks that focuses on the transport and session layer, rather the network layer.

CONCURRENT MULTIPATH TRANSFER

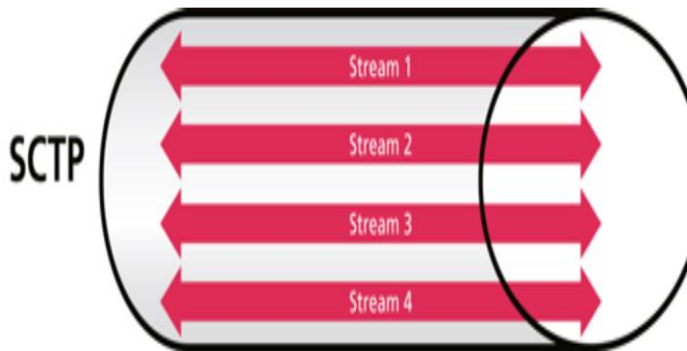
The CMT (concurrent multipath data transfer) using SCTP (stream control transmission protocol) to enable multi homed data communications. The communication is fully based on the ip address. More ack traffic due to fewer delayed acks. We propose three algorithms which augment and modify current SCTP to Counter these side-effects and present initial simulations indicating correctness of the proposed solutions. In this work, we operate under the strong assumptions that the receiver's advertised window does not constrain the sender, and that the bottleneck queues on the end-to-end paths used in CMT are independent of each other.



STREAM CONTROL TRANSMISSION PROTOCOL(SCTP)

SCTP is a type of mobility management for IP based networks that focuses on the transport and session layer, rather the network layer. SCTP can be used as the transport protocol for applications where monitoring and detection of loss of session is required. SCTP is a transport layer protocol, serving in a similar role to the popular protocols TCP and UDP. SCTP provides some of the same service features of both UDP and TCP. It is message oriented like UDP and ensures reliable, in sequence transport of messages with congestion control like TCP. It differs from these in providing multi-homing and redundant paths to increase resilience and reliability.

Features of SCTP include Multi-homing support in which one or both end points of a connection can consist of more than one IP address. SCTP provides redundant paths to increase reliability. SCTP offer recognize error-free non-duplicated transfer of video. An SCTP end point is represented to its peers as a combination of a set of eligible destination transport address to which SCTP packet can be send and a set of eligible source transport addresses from which SCTP packets can be received. A transport address used by on SCTP end point is unique to on SCTP end point.

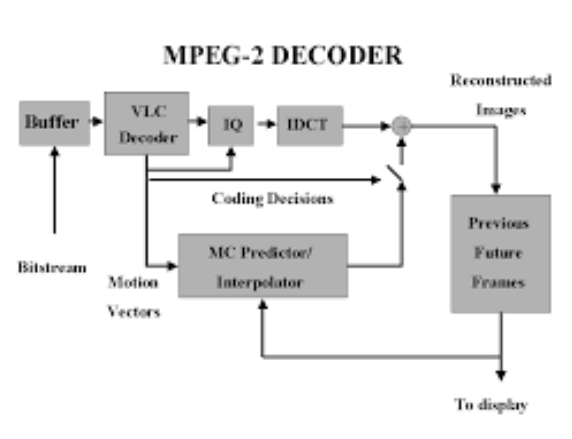
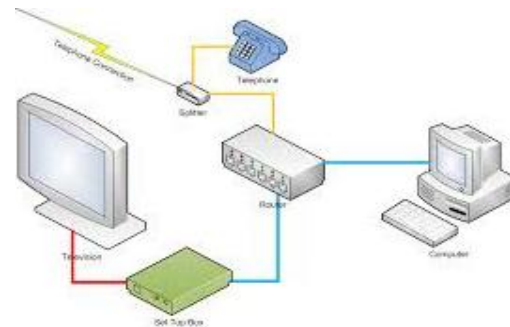


VIDEO DECODER

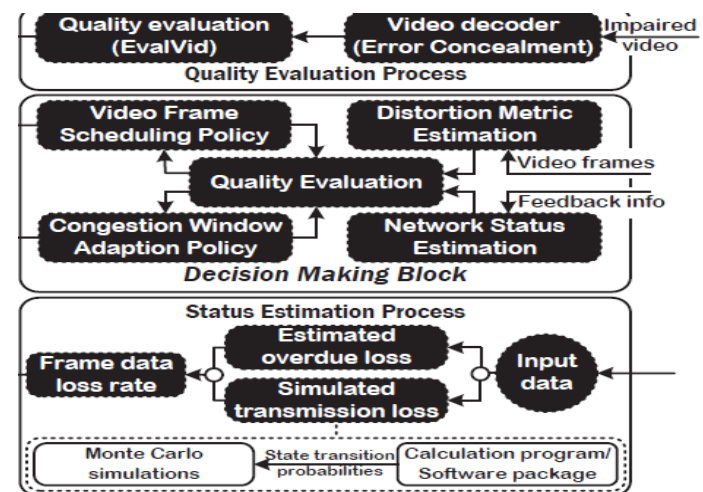
A Video decoder is an electronic circuit, contained within a single integrated circuit chip, that converts base band analog video signal to digital components video. A video encoder perform the inverse function of a video decoder. Converts raw digital video to analog video. The decode process collect the total number of streaming values. Then the streaming value arranged to the ascending order, then converted into the original format. In early versions of UVD, video post-processing is passed to the pixel shaders and OpenCL kernels. MPEG-2 decoding is not performed within UVD, but in the shader processors. The decoder meets the performance and profile requirements of Blu-ray and HD DVD, decoding H.264 bitstreams up to a bitrate of 40 Mbit/s.

Unlike video acceleration blocks in previous generation GPUs, which demanded considerable host-CPU involvement, UVD offloads the entire video-decoder process for VC-1 and H.264 except for video post-processing, which is offloaded to the shaders. MPEG-2 decode is also supported, but the bitstream/entropy decode is not performed for MPEG-2 video in hardware. Previously, neither ATI Radeon R520 series' ATI Avivo nor NVidia Geforce 7 series' PureVideo assisted front-end entropy decompression in VC-1 and H.264 - the host CPU performed this work. UVD handles VLC/CAVLC/CABAC, frequency transform, pixel

prediction and inloop deblocking, but passes the post processing to the shaders.^[8] Post-processing includes denoising, de-interlacing, and scaling/resizing. AMD has also stated that the UVD component being incorporated into the GPU core only occupies 4.7 mm² in area on 65 nm fabrication process node.



QUALITY EVALUATION BASED DECISION MAKING

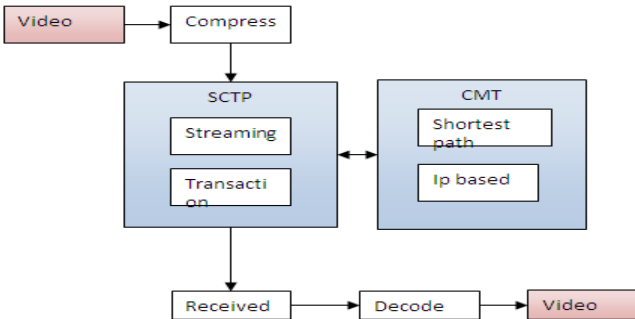


ALGORITHM:DECISION MAKING PROCESS IN CMT-CA

Input:{ $RTT_{p,lp},p_{ep},T$,encoded video frames;
Output:Congestion window size{ $cwnd_p,p_{ep}$,frame scheduling vector $\{o_p\}_{p_{ep}}$;
1 Foreach decision epoch **do**
2 Estimate the model parameters for total distortion using the global estimation method;
3 Update the congestion window size with Algorithm 2;
4 Invoke the unequal frame scheduling algorithm
5 end
6 procedure Network status Emulation:
7 Calculate the state transition probabilities of different communication paths by invoking the software package/calculation program;
8 Estimate the transmission losses using Monte carlo simulation and calculate the overdue loss rate using equations.
9 end
10 procedure Quality Evaluation:
11 Use the combined packet loss pattern,and input video data to reconstruct the received video frames that experienced impairments;
12 Decode the received video frames with the error concealment process and measure the per-frame distortion using the Evalvid toolset;
13 end

PERFORMANCE EVALUATION

In this section the evaluation result obtained through semi physical emulation in the extra platform.



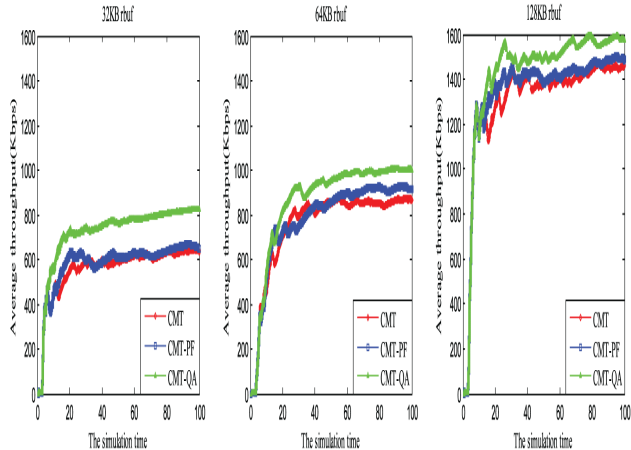
As shown in this above figure, thus the video is encoded and pass through the SCTP and CMT, finally

decoded to the receiver. The reference schemes in terms of video peak signal to noise ratio(PSNR).The CMT-CA outperforms improving video PSNR and reducing end-to-end delay ratio.The throughput the value.

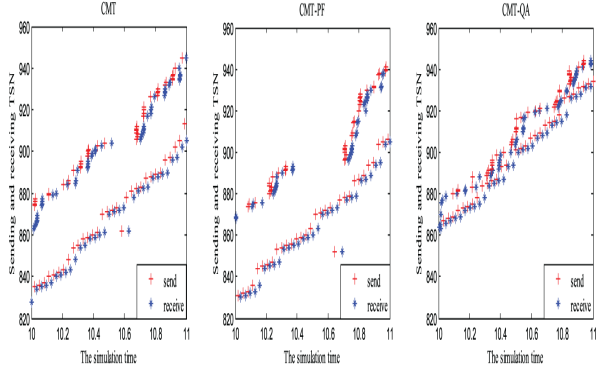
EMULATION RESULTS

PSNR:

peak signal to noise ratio,often abbreviated PSNR,is an engineering term for the ratio between the maximum possible power of a signal and the power of corrupting noise that affects the fidelity of its representation.Because many signals have a very wide dynamic range,PSNR is usually expressed in terms of the logarithmic decibel scale.The PSNR results for different video encoding rates in Trajectory.It can be observed CMT-CA and reference schemes is larger when the available bandwidth is tight compared to the video streaming rate.The CMT-QA path quality is estimated based on the ratio of chunk delivery time to sending buffer size.The RTX-CWND is selected as the transmission policy in CMT.The retransmission is send to the destination. The largest congestion window size and a tile is broken with the random selection process.



(A)CMT-QA



(B)CMT

CONCLUSION

This paper proposes a CMT scheme Data security is very high.Using concurrent multipath transfer reduce the traffic problem.

Emulation results CMT outperforms the reference scheme in improving video PSNR and reducing end to end delay.In this paper the video distribution problem is very less.

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Author Profile



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