Online Auction for IaaS Clouds towards Elastic User Demands and Weighted Heterogeneous VMs

Abstract

- In this paper, we investigate the transmission time of a large amount of data over fading wireless channel with adaptive modulation and coding (AMC).
- Unlike traditional transmission systems, where the transmission time of a fixed amount of data is typically regarded as a constant, the transmission time with AMC becomes a random variable, as the transmission rate varies with the fading channel condition.
- To facilitate the design and optimization of wireless transmission schemes for big data applications, we present an analytical framework to determine statistical characterizations for the transmission time of big data with AMC.

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- In particular, we derive the exact statistics of transmission time over block fading channels. The probability mass function (PMF) and cumulative distribution function (CDF) of transmission time are obtained for both slow and fast fading scenarios.
- We further extend our analysis to Markov channel, where transmission time becomes the sum of a sequence of exponentially distributed time slots.

Existing

- WE are entering a big data era. Data are generated and collected at an accelerating rate.
- The timely processing, delivery, and analysis of these data can bring huge social and economical benefit.
- With the intense of recent and ongoing deployment of wireless communication systems, much of the big data will be transmitted wirelessly.
- In fact, smart mobile devices contribute significantly to the generation of big data. Over the past several years, mobile data traffic has been experiencing a compound annual growth rate of over 40%.
- This growth rate is expected to accelerate in the coming years as the result of increasing popularity of mobile broadband applications.

disadvantage

- Specifically, transmission time is closely related to the service time in the queuing setup, which is essential to the delay and throughput analysis of various wireless transmission Strategies

- assume a constant transmission time for a fixed amount of data The transmission time over a point-to-point link is typically calculated as the ratio of the amount of data over the transmission rate when the transmission rate is constant.

Proposed

The contributions of this work can be summarized as follow:

- We propose a general analytical framework for the trans-mission time of big data with AMC over fading wireless channels.
- Most previous works assumed constant rate transmission. We generalize the analysis by allowing variable transmission rate, which is especially applicable to big data transmission.
- The exact distribution functions of transmission time over block fading channels are derived.
- To reduce the computation complexity, we also obtain an approximate probability mass function (PMF) of the transmission time in fast fading scenario.

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- For Markov channels, the exact PDF of transmission time is derived assuming that data transmission completes within a few channel coherence time, which is applicable for big data transmission over slow fading environment.
- For fast fading scenario, the approximate PDF of transmission time is also obtained using the central limit theorem.
- Selected numerical examples are presented and discussed to illustrate the mathematical formulations.
- We show that the transmission time of big data with AMC may vary dramatically with the prevailing fading channel condition.
- These analytical results will greatly facilitate further improvement of wireless transmission schemes for big data applications.

Advantage

- When the amount of data becomes massive, the transmission will experience variable channel quality, and as such, different transmission rate with AMC
- generalized our analysis to continuous-time Markov channel, where transmission slots have random length

HARDWARE REQUIREMENTS

- Processor – Pentium –III
- Speed – 1.1 Ghz
- RAM – 256 MB(min)
- Hard Disk – 20 GB
- Floppy Drive – 1.44 MB
- Key Board – Standard Windows Keyboard
- Mouse – Two or Three Button Mouse
- Monitor – SVGA

SOFTWARE REQUIREMENTS

- Operating System : Windows 8
- Front End : Java /DOTNET
- Database : Mysql/HEIDISQL

Conclusion

- In this paper, we proposed an analytical approach to investigate the transmission time of big data with AMC over wireless channels.
- When the amount of data becomes massive, the transmission will experience variable channel quality, and as such, different transmission rate with AMC. We derived the exact PMF and CDF of the transmission time under block fading channel model.
- Then we generalized our analysis to continuous-time Markov channel, where transmission slots have random length.
- The distribution functions of the transmis-sion time for slow and fast fading environments are obtained.
- While previous work assumes constant transmission time for a fixed amount of data, we observe that transmission time of big data varies drastically around its average.

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