

ENSC 427: COMMUNICATION NETWORKS FINAL PROJECT PRESENTATION SPRING 2010

Analysis on the Performance of ATM Network Based on CBR and UBR

Group 12

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Context

- Introduction
 - Background Information
 - OPNET Simulation Details
 - Discussion of Results
 - Conclusion and Ideas of Future Works
 - Reference
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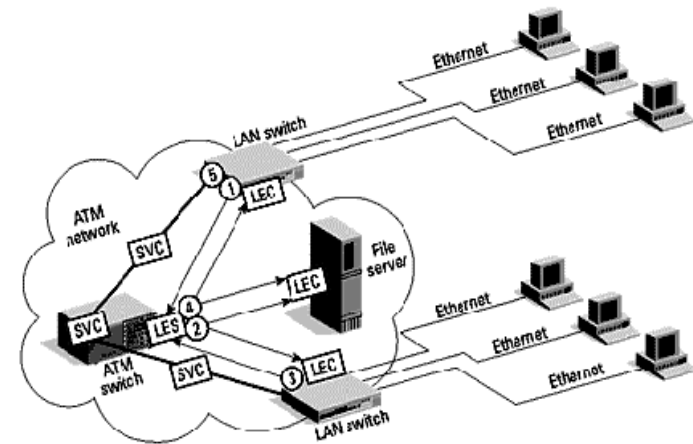
Background Information

ATM – Asynchronous Transfer Mode

- ❑ Cell-based data transmission technology
 - ❑ Cells are in fix length-53 bytes
 - ❑ Diverse application transmission – Voice, Ftp, Email, Video Conferencing
 - ❑ Four service classes:
 - ABR — Average Bit Rate
 - CBR — Constant Bit Rate
 - UBR — Unspecified Bit Rate
 - VBR — Variable Bit Rate
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Introduction

- ❑ ATM is implemented as a network protocol and was first developed in mid 1980s
- ❑ Goal — A single networking strategy to transport real-time conference and audio, as well as image, text, email
- ❑ Several organizations are involved in the creation of the standard, such as ITU, IETF



OPNET Simulation Details

- Objective:

Examine the effect of ATM for variable applications on the different layers and service classes

- Two Applications: FTP and Voice

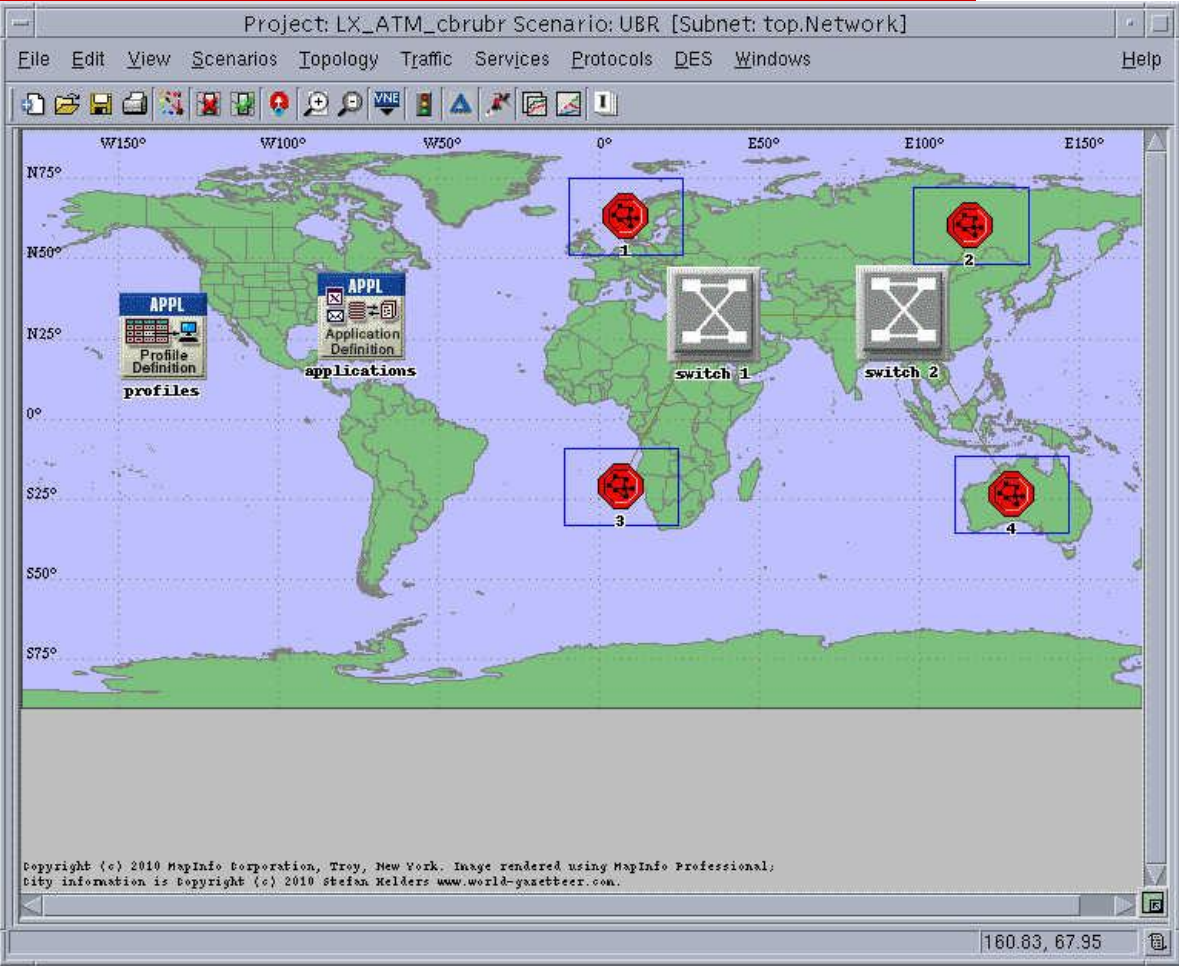
- Two Service Classes: CBR and UBR

- Two OPNET Scenarios:

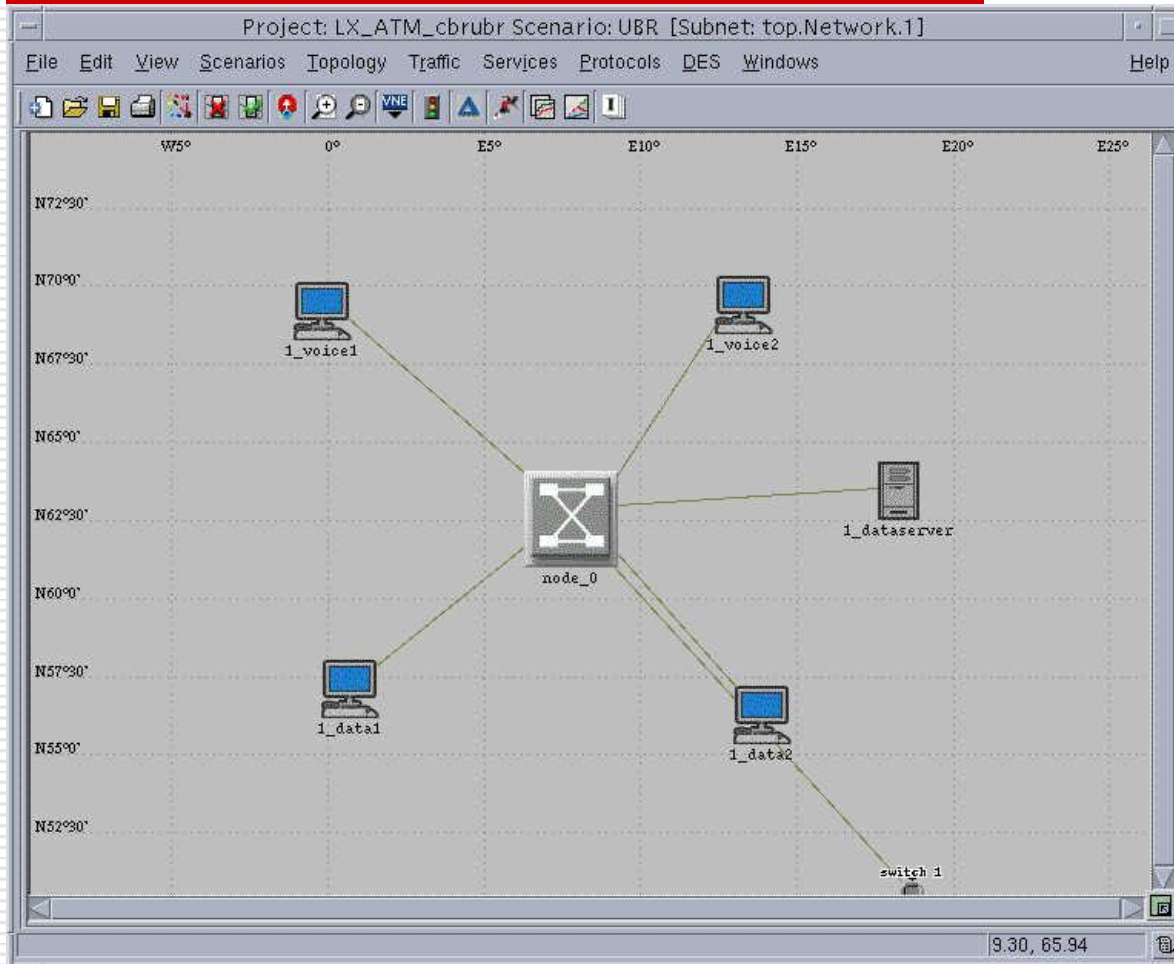
CBR: CBR for FTP and VOICE application

UBR: UBR for FTP and VOICE application

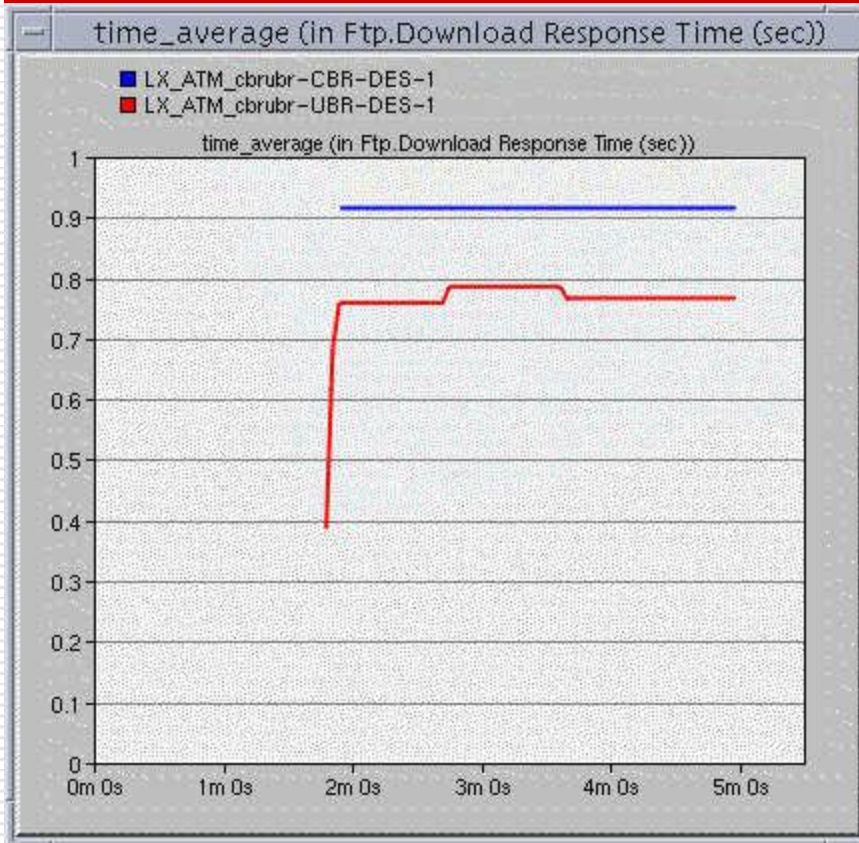
Network Topologies



Network Topologies

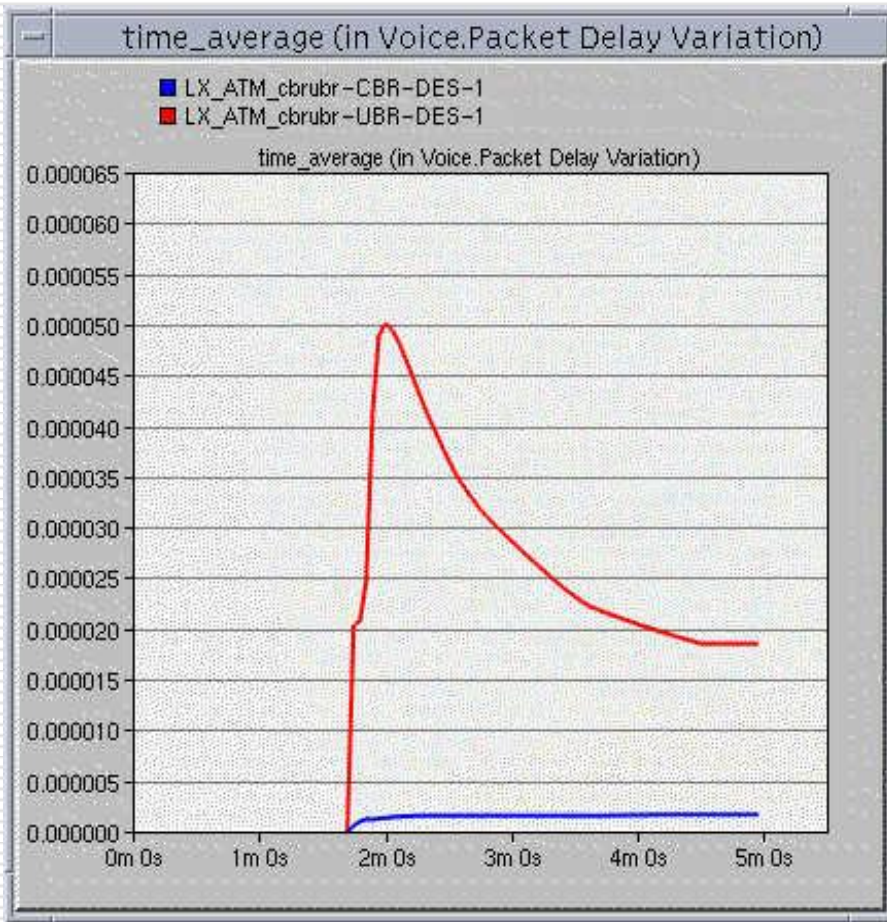


Results of FTP Application– Download Response Time



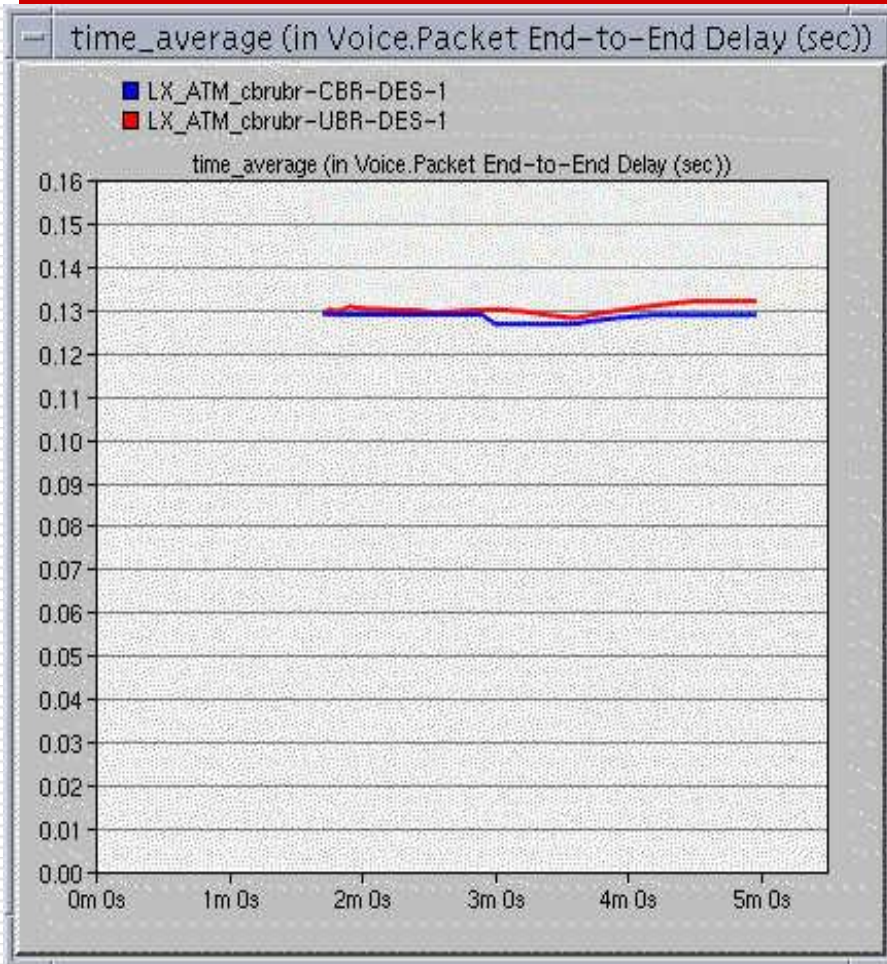
The download response time of **UBR** is lower than **CBR**

Results of Voice Application– Packet Delay Variation



- Packet Delay of **UBR** fluctuates dramatically.
- Packet Delay of **CBR** is stable and close to zero.

Results of Voice Application– End-to-End Delay

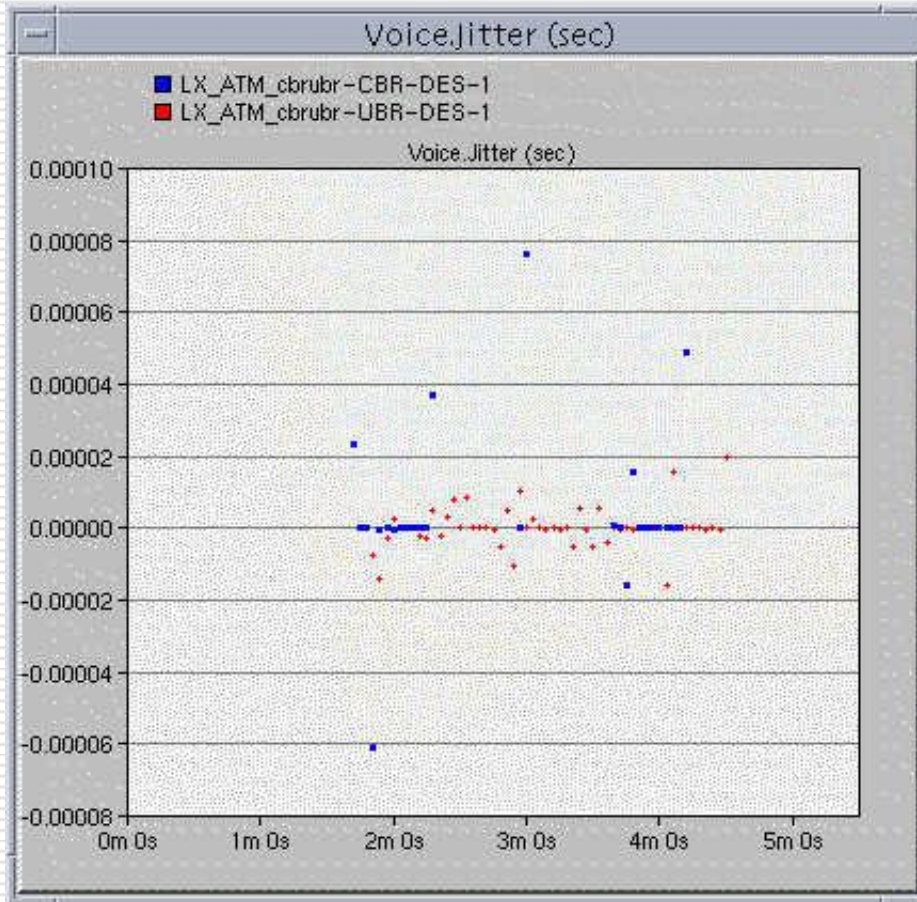


The End-to-End delay of **UBR** is slightly lower than **CBR**

We only have four subnets, there are millions of clients in real life

UBR is much better than **CBR**

Results of Voice Application– Jitter



- Lots of Jitter in **UBR** compared with **CBR**
 - All Jitter are less than 0.00008 seconds
 - It won't be noticeable to users
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Conclusions

CBR

- ❑ Strict with QoS, transfer delay, Packet Loss, Jitters
- ❑ Instant service, in specified bandwidth, such as Voice transmission

UBR

- ❑ No guarantee for service
 - ❑ Applicable in a very tolerant of delay and cell loss environment
 - ❑ FTP, Email
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Future Works

- ❑ Implement other service classes, such as VBR, ABR
 - ❑ Test in other Applications, such as video conferencing
 - ❑ Expand the file size for E-mail and FTP applications
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 - ❑ Constant bit rate
http://en.wikipedia.org/wiki/Constant_bitrate
 - ❑ Unspecified bit rate
 - ❑ http://en.wikipedia.org/wiki/Traffic_contract#Unspecified_Bit_Rate_.28UBR.29
 - ❑ Kasera ,Sumit – ATM networks: concepts and protocols, pp144, 2007
 - ❑ Kesidis, George – ATM network performance, Chapter 7.1, 2000
 - ❑ McDysan,David E – QoS &traffic management in IP &ATM networks, pt 2,2000
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Thank You

Questions?
