ENCS 427: COMMUNICATION NETWORKS FINAL PROJECT PRESENTATION

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WI-FI NETWORK SIMULATION

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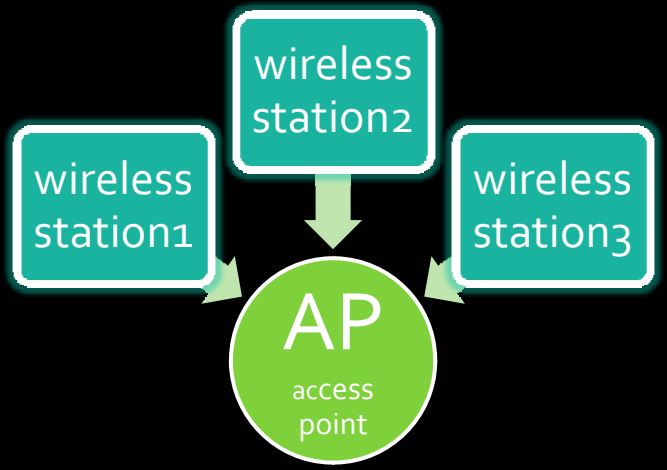
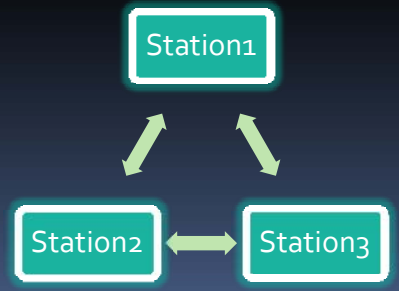
INTRODUCTION

- Wi-Fi (Wireless Fidelity) is a generic term that refers to the IEEE 802.11 communications standard for Wireless Local Area Networks (WLANs).
- To simulate a office wireless network by using Wi-Fi technology
- Goal:
  - Find network traffic of various scenarios in an office network
  - Network delay by various number of user and data traffic

IMPLEMENTATION DETAILS

- Protocol: 802.11
- Infrastructure Mode: AP Based, clients communicate through Access Point.
- Ad-Hoc Mode: AP not required, clients connect to each other directly





Case 1 – Add/Drop Applications

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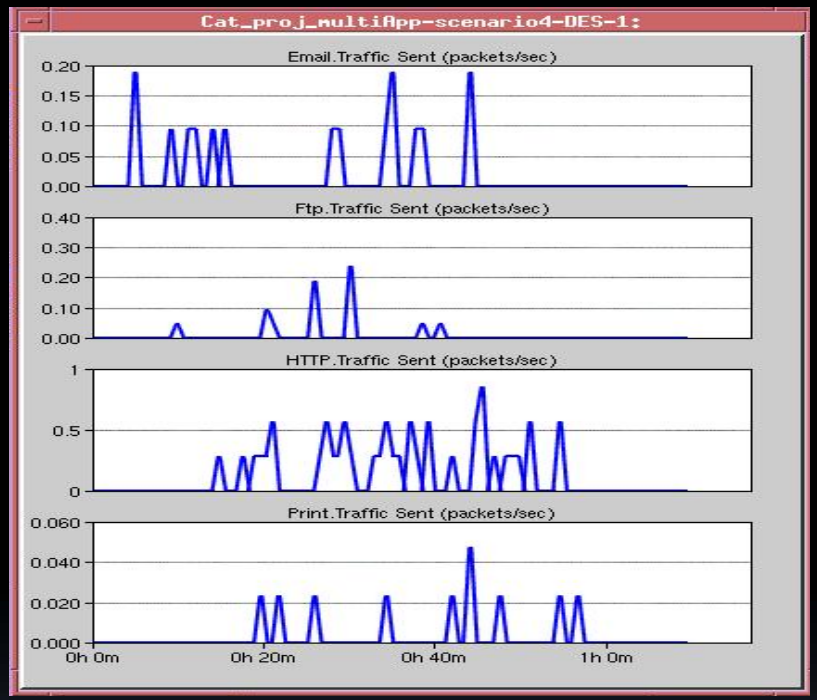
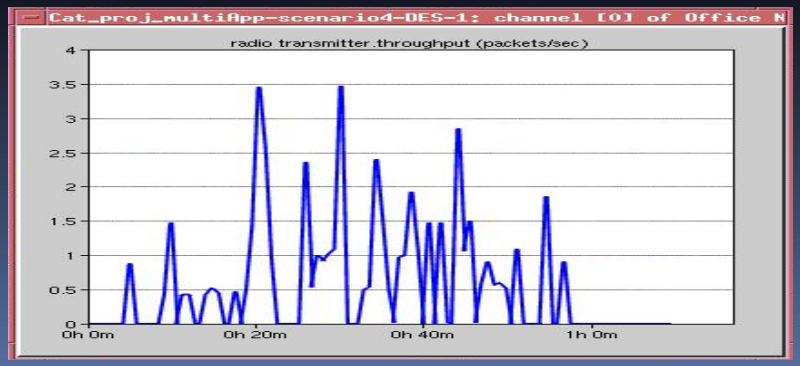
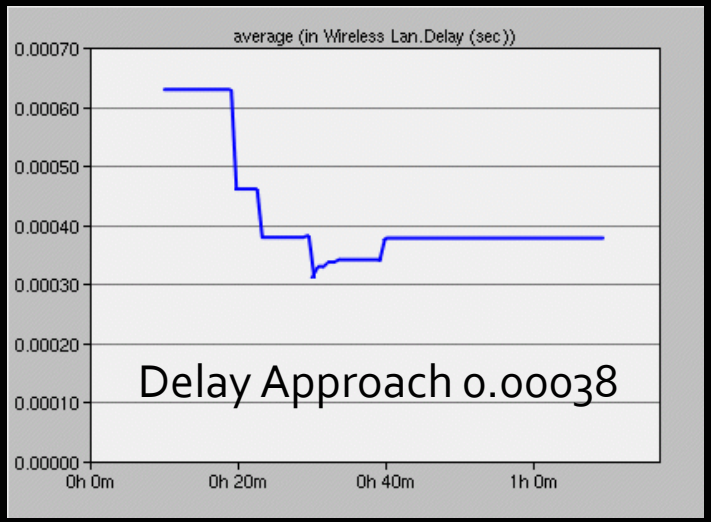
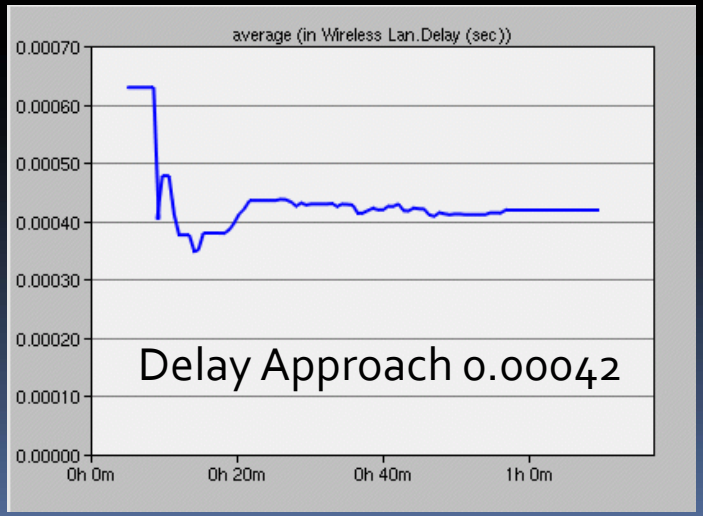






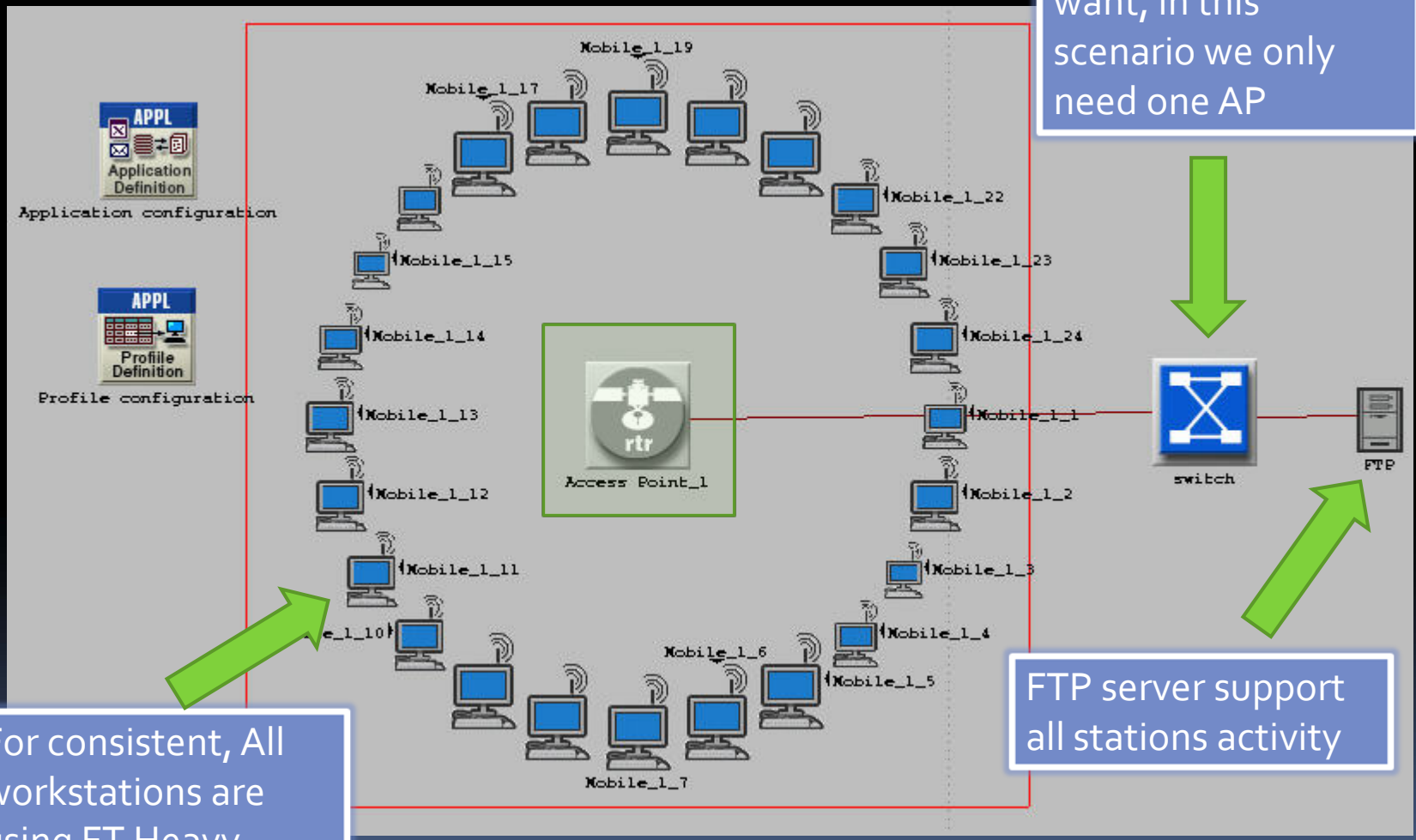


Case 2 Multi-Workstations

- 24 workstations joined network 1 by 1
- 24 workstations joined network simultaneously
- 24 workstation joined network simultaneously with high intensity

Basic Set up (24WS)

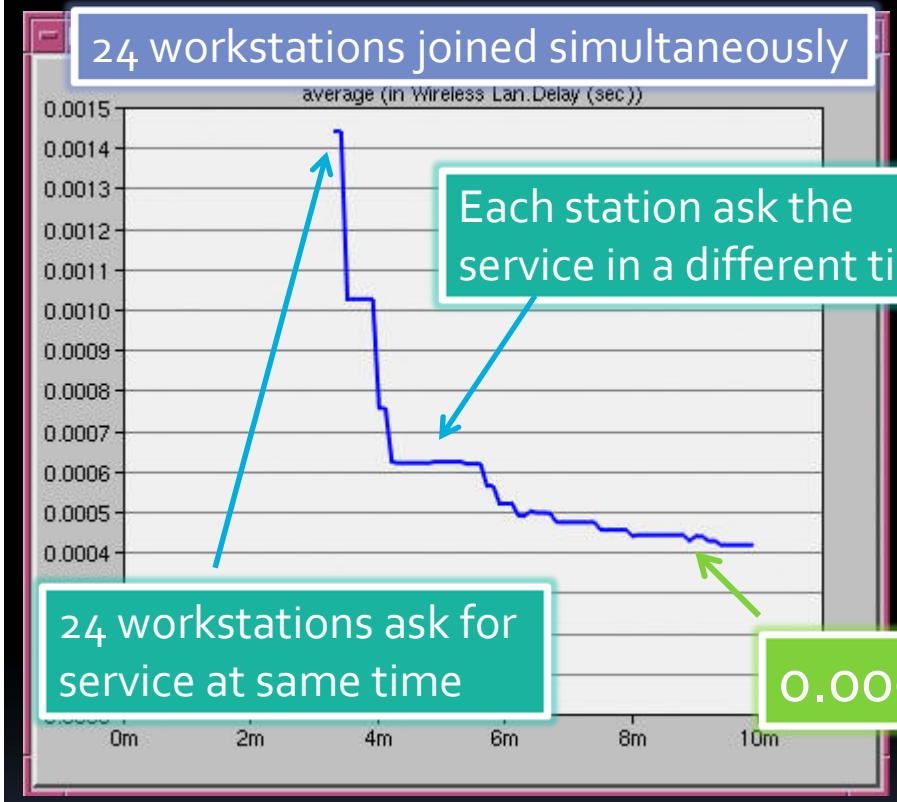
Can connect as many as AP we want, in this scenario we only need one AP

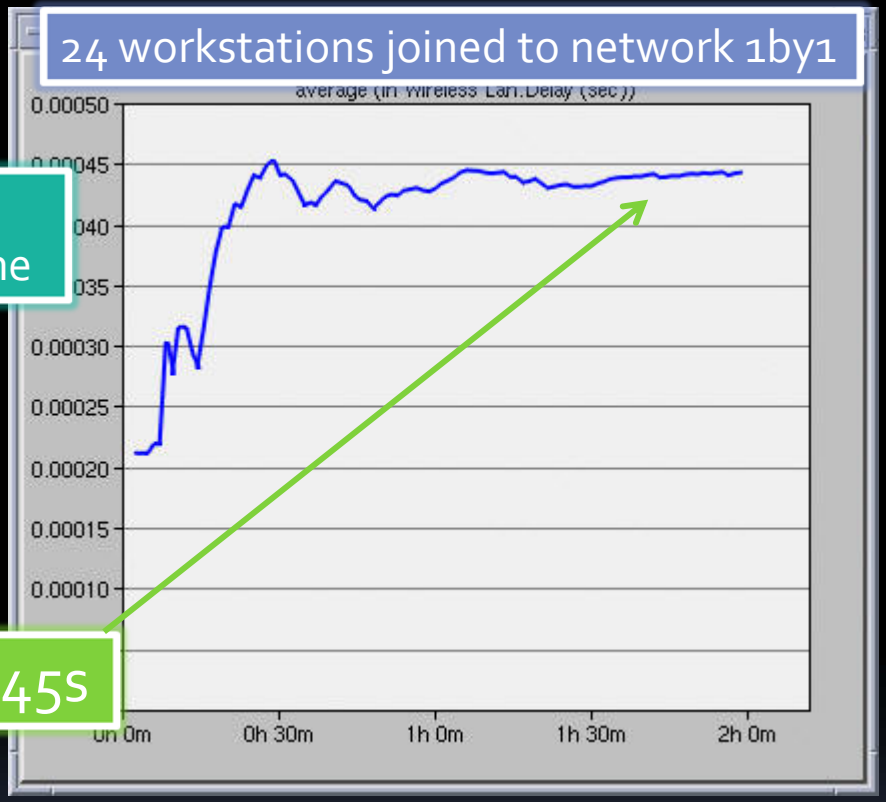


For consistent, All workstations are using FT Heavy application

FTP server support all stations activity

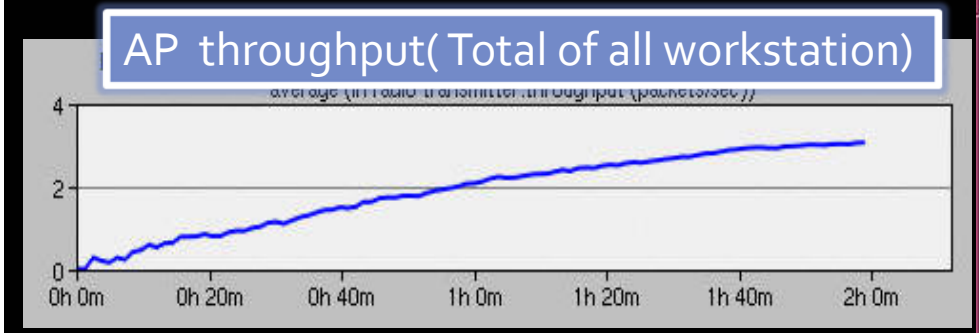
AP delay comparison



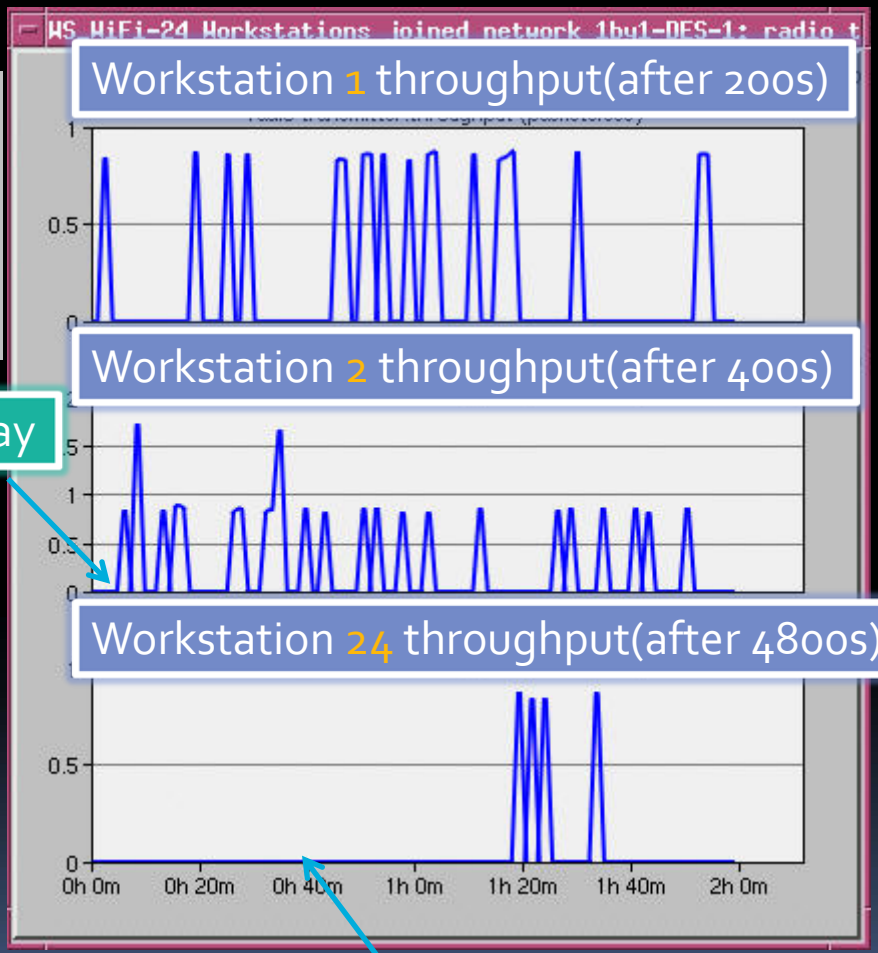


- Eventually the AP delay time reach to a stable
- More workstation communicate with AP result a longer delay.

Workstations joined 1 by 1



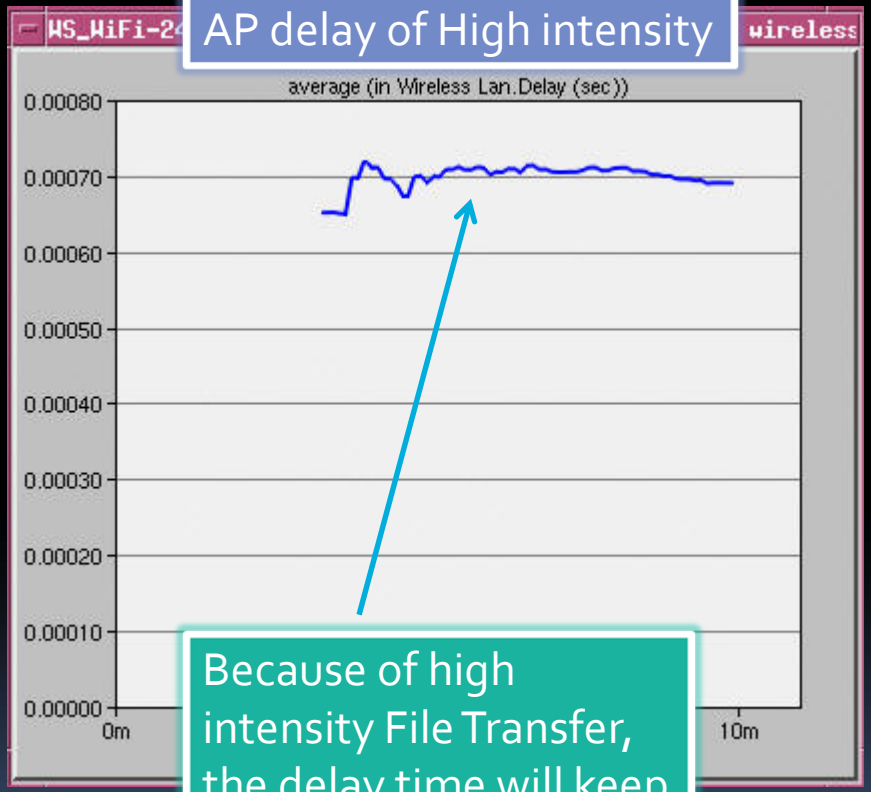
- Every 200s , 1 more workstation will join to the network



High VS Low intensity

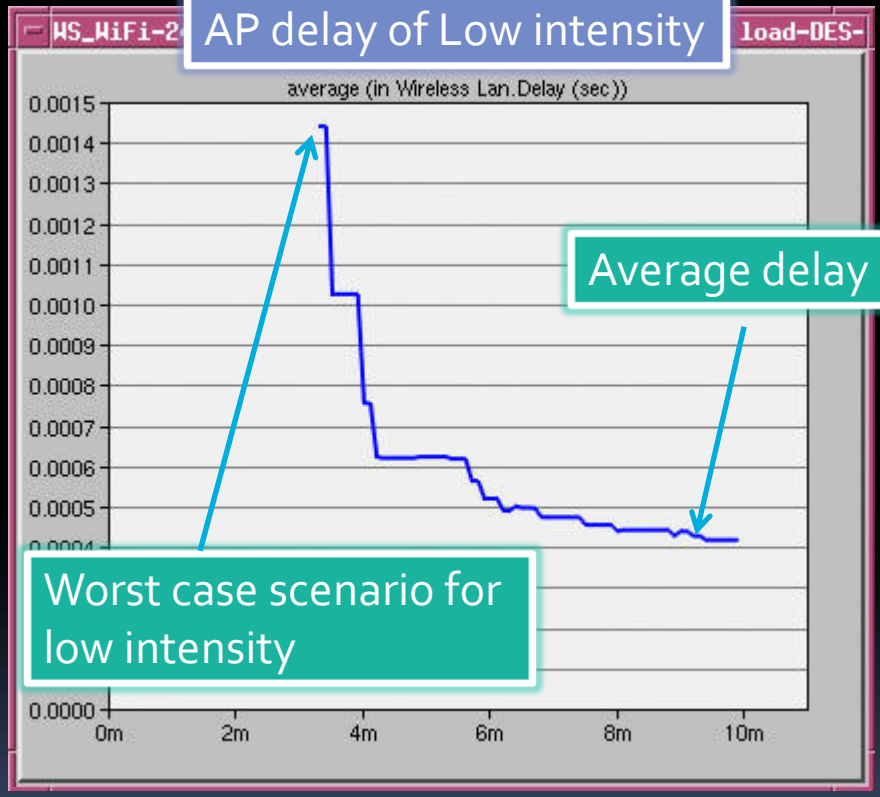
24 workstation joined simultaneously

AP delay of High intensity



Because of high intensity File Transfer, the delay time will keep constant.

AP delay of Low intensity



Average delay

Worst case scenario for low intensity

Constant 10s

FTP

Exponential 360s

Attribute
Custom
Database

(Ftp) Table

Attribute	Value
Command Mix (Get/Total)	100%
Inter-Request Time (seconds)	constant (10)
File Size (bytes)	constant (50000)
Symbolic Server Name	FTP Server
Type of Service	Best Effort (0)
RSVP Parameters	None
Back-End Custom Application	Not Used

(Ftp) Table

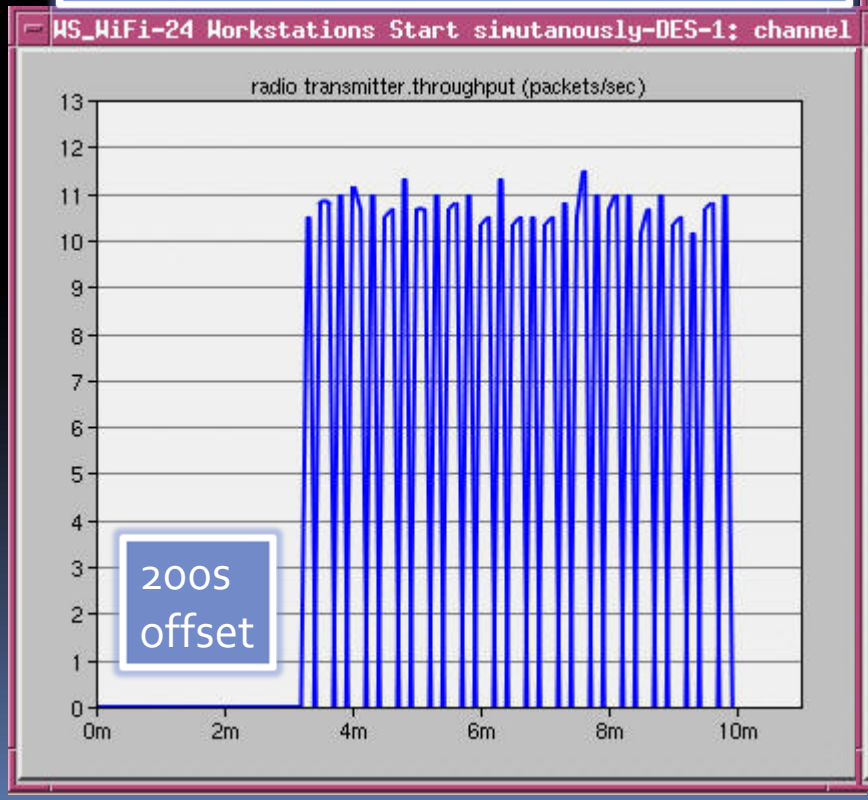
Attribute	Value
Command Mix (Get/Total)	50%
Inter-Request Time (seconds)	exponential (360)
File Size (bytes)	constant (50000)
Symbolic Server Name	FTP Server
Type of Service	Best Effort (0)
RSVP Parameters	None
Back-End Custom Application	Not Used

OK Cancel

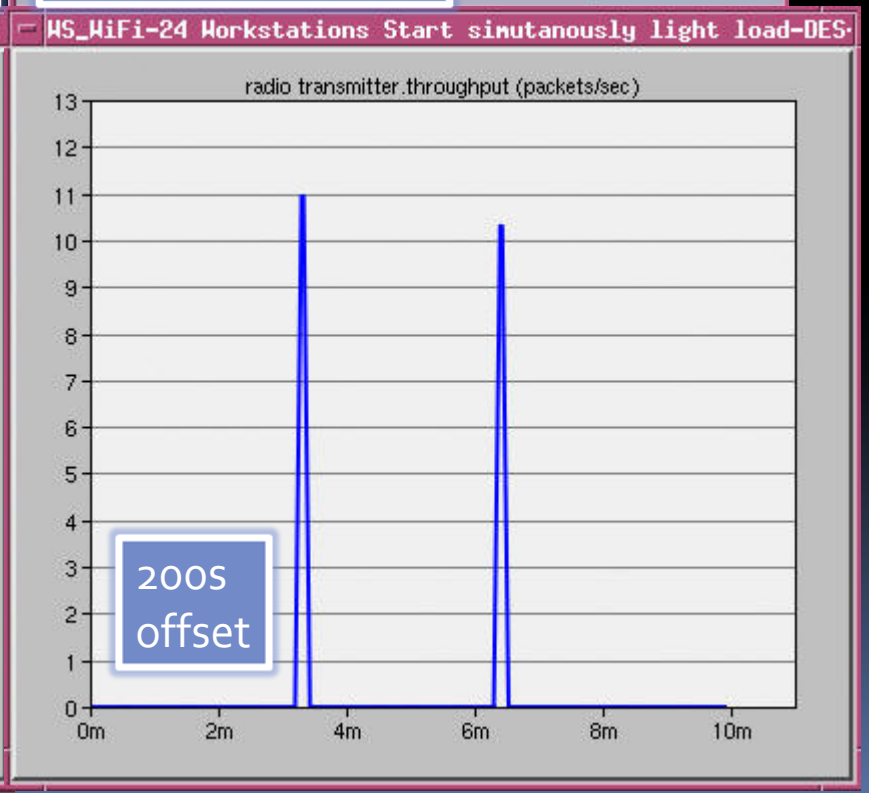
File Transfer Heavy with high intensity

File Transfer Heavy

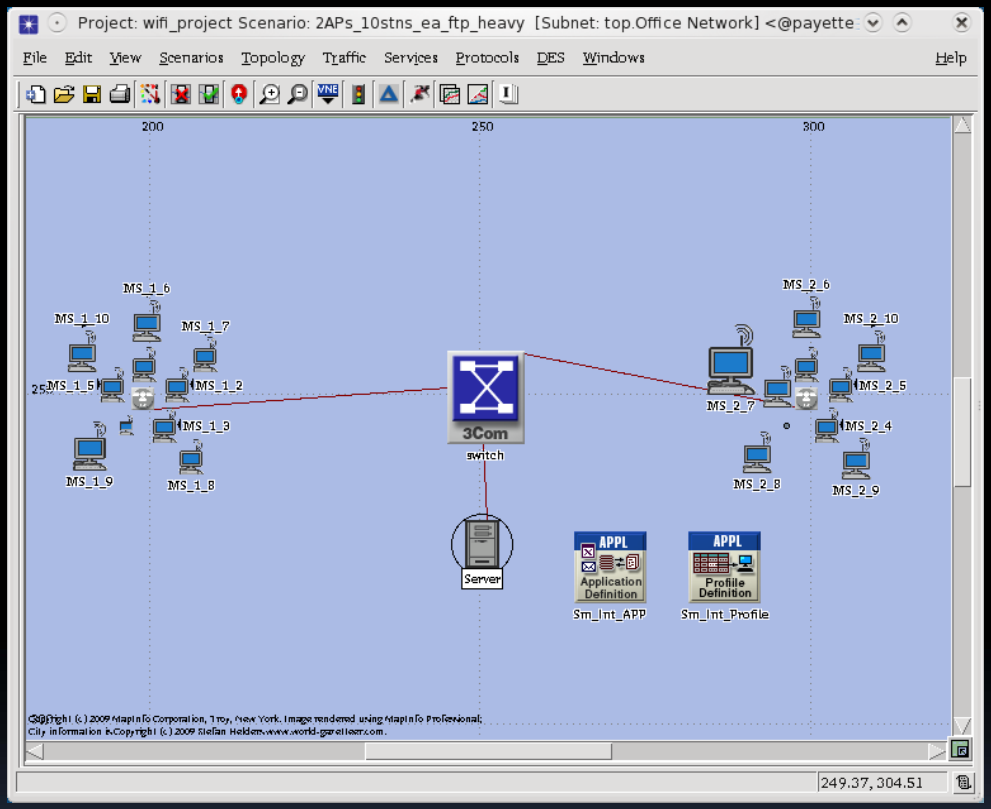
WS_WiFi-24 Workstations Start simutanously-DES-1: channel



WS_WiFi-24 Workstations Start simutanously light load-DES-

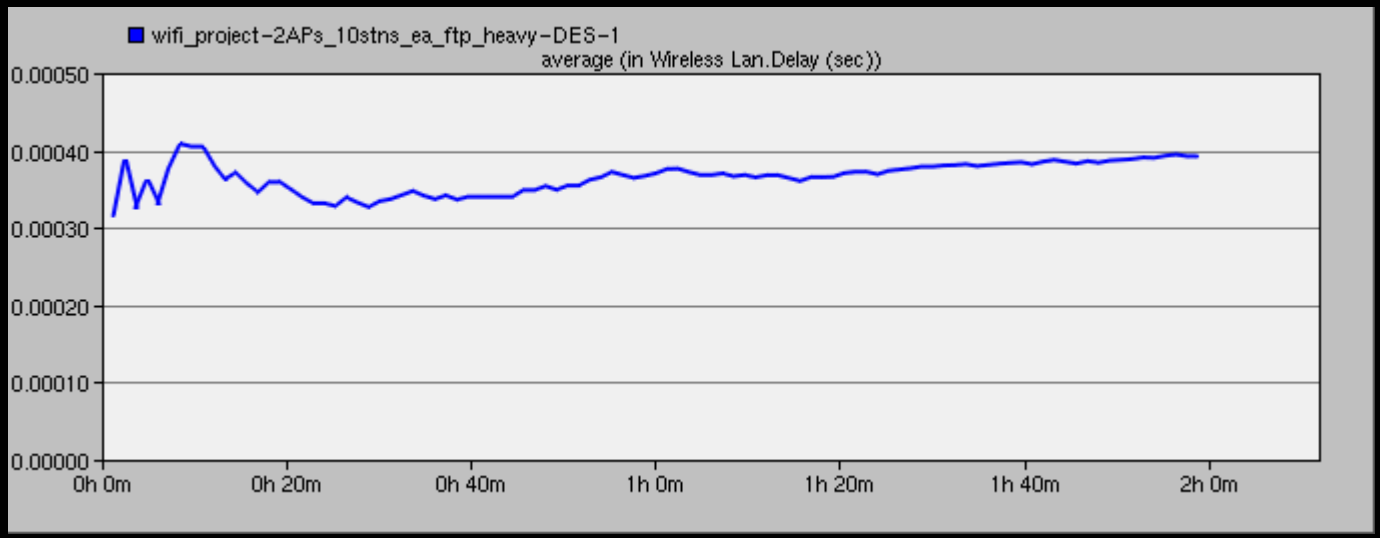


Case 3 – Multi-APs



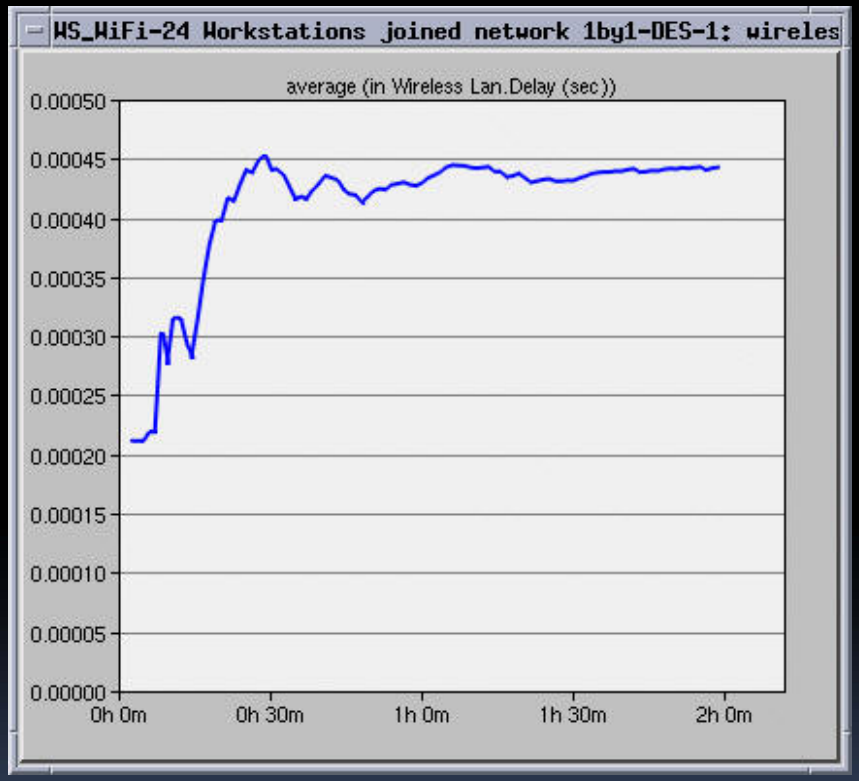
- 2 Access Points
- 10 stations on each AP
- All stations – FTP heavy Application

Case 3 – Multi-APs (con't)



- AP delay time (sec)
- Delay time is about 0.00040 second

Case 3 – Multi-APs (con't)



- The delay time in case 2 is about 0.00045 second
- 2 APs case has a slight improvement

Conclusion

- More Access Points can reduce the load on each router, hence reduce the delay that a router would create.
- In turn enhances the service quality for each user in the network.
- In a Wi-Fi network with 10 work stations or more, it is definitely a good idea to put in more Access Points.

- Any Questions?

- The End