TCOM610 Sec 001 – IP Routing – BGP
Department of Electrical and Computer Engineering
George Mason University
Fall, 2008

Course Description
This is one of the main courses on IP routing protocol series designed to teach the current state of art for Internet routing. The course covers Internet evolution, RFC specifications for BGP routing and its extensions, vendor BGP implementation and configuration syntax, and routing policy and implementation in enterprises and Internet service providers networks (ISP). The topics includes BGP4 standards, BGP protocol states, BGP routing attributes, BGP decision algorithm, route-reflector and AS confederation (iBGP), BGP routing policy, traffic load-balancing and routing redundancy, BGP damping, MP-BGP, L2-/L3-VPN with MPLS and BGP convergence.

Prerequisites
Students must finish at least TCOM509, TCOM514/515 equivalence before taking this class. TCP/IP protocols, IP routing basics, and IP addresses knowledge are assumed. Students are also recommended to take IGP routing course (TCOM609) before or after taking this BGP course.

Location & Time
Fairfax Campus, Enterprise Hall 275, Tuesday, 7:20-10:00PM, August, 25 – December 17, 2008

Instructor
Dr. George Y. Wu, ywu5@gmu.edu or yunqing_wu@yahoo.com
Teaching Assistant: Padmanabhan Raman (praman@gmu.edu)
Office Hour: By email, or by appointment only in STII-235

Textbooks

References


Grading and Projects
There will be one mid-term exam and one final exam. All exams are closed book. There will be one individual project. Students are required to submit the project to the instructor prior the due date electronically. Late projects will not be accepted unless the prior permission has been granted. Your final course graded will be calculated as follows:

- Mid-term 30%
- Final Exam 40%
- Project 30%

Tentative Schedule
- Week 1: Overview of TCP/IP, IP routing and addressing (Aug 26)
- Week 2: BGP protocol specification RFC4271 (Sept 2)
- Week 3: BGP configuration and BGP attributes; Lab Demo (1) (Sept 9)
- Week 4: BGP Decision process and BGP Policy (Sept 16)
- Week 5: Redundancy and Load balancing, BGP Case Study (Sept 23)
- Week 6: BGP Scaling: IBGP, Route-reflector and AS confederation (Sept 30)
- Week 7: BGP Troubleshooting, Lab Demo (2) and Mid-term review (Oct 7)
  - NO CLASS Oct 14 (Columbus Day for Tuesday class)
- Week 8: Mid-term and Project discussion (Oct 21)
- Week 9: ISP Services design and Peering (Oct 28)
- Week 10: BGP extension: capacity, refresh, BGP security (Nov 4)
- Week 11: BGP convergence, route damping and performance tuning (Nov 11)
- Week 12: MPLS and L2/L3 VPN Architecture (Nov 18)
- Week 13: L2/L3 VPN Configuration and implementation (Nov 25) Thanksgiving Week
- Week 14: Review and Project discussion (Dec 2)
- Week 15: Final Exam (Dec 9)