

CSE 693
Resource Management and
Performance Analysis
in Wireless Networks

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What is this course about?

- ✓ *Introductory* (first) course in Resource Management and Performance Analysis in Wireless Networks
- ✓ learn *principles* of Resource Management
- ✓ learn *practice* of Resource Management

- ✓ *Goals:*
- ✓ learn a lot (not just factoids, but principles and practice)
- ✓ have fun (well, it should be interesting, at least)

Course Information

➤ Course materials:

➤ text: J. Zander and S.-L. Kim, Radio Resource Management for Wireless Networks, Artech House Publishers, 2001.

➤ References:

➤ S. Kyriazakos and G. Karesos, Practical Radio Resource Management in wireless networks, Artech House Publishers, 2004.

➤ T. Janevski, Traffic Analysis and Design of Wireless IP Networks, 2003

➤ A. Jamalipour, The Wireless Mobile Internet, Wiley, 2003.

➤ Recent Journal and Conference papers

Evaluation / Assessment

- ✓ Homework & Quizzes 25%
 - ✓ Mid-term Exam 30 %
 - ✓ Project (research proposal based) 45 %
 - ✓ Final Exam
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- ✓ A+ > 90

Course Information (more)

Odd and ends...

- ✓ me
- ✓ in-class style: interaction, questions (*please!*)
 - ✓ *Cheating will not be tolerated. At least 0 in quiz, homework, exam, etc.*
 - ✓ *DN Grade (exceeding 6 absences)*
 - ✓ *WF Grade (poor performance)*
- ✓ getting into this course...

- ✓ Questions, comments, ... ???

Course Overview:

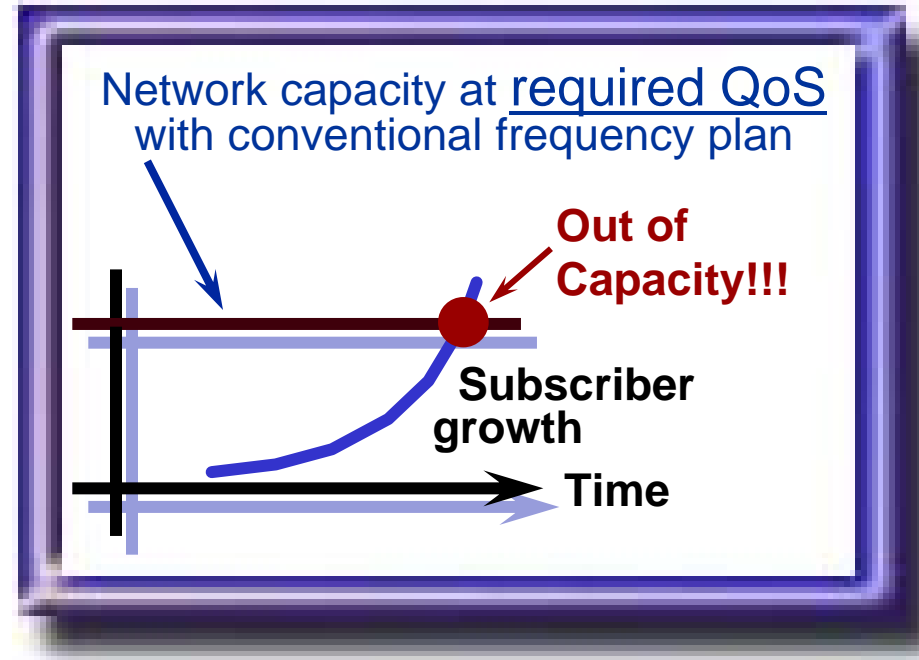
Part 1: Introduction: Why resource management?

- ✓ Wireless Evolution & A brief history of networking
- ✓ Inherent characteristics of wireless networks
- ✓ What is QoS?
- ✓ What are the questions that resource management tries to answer?

Capacity & Spectrum Utilization Solution

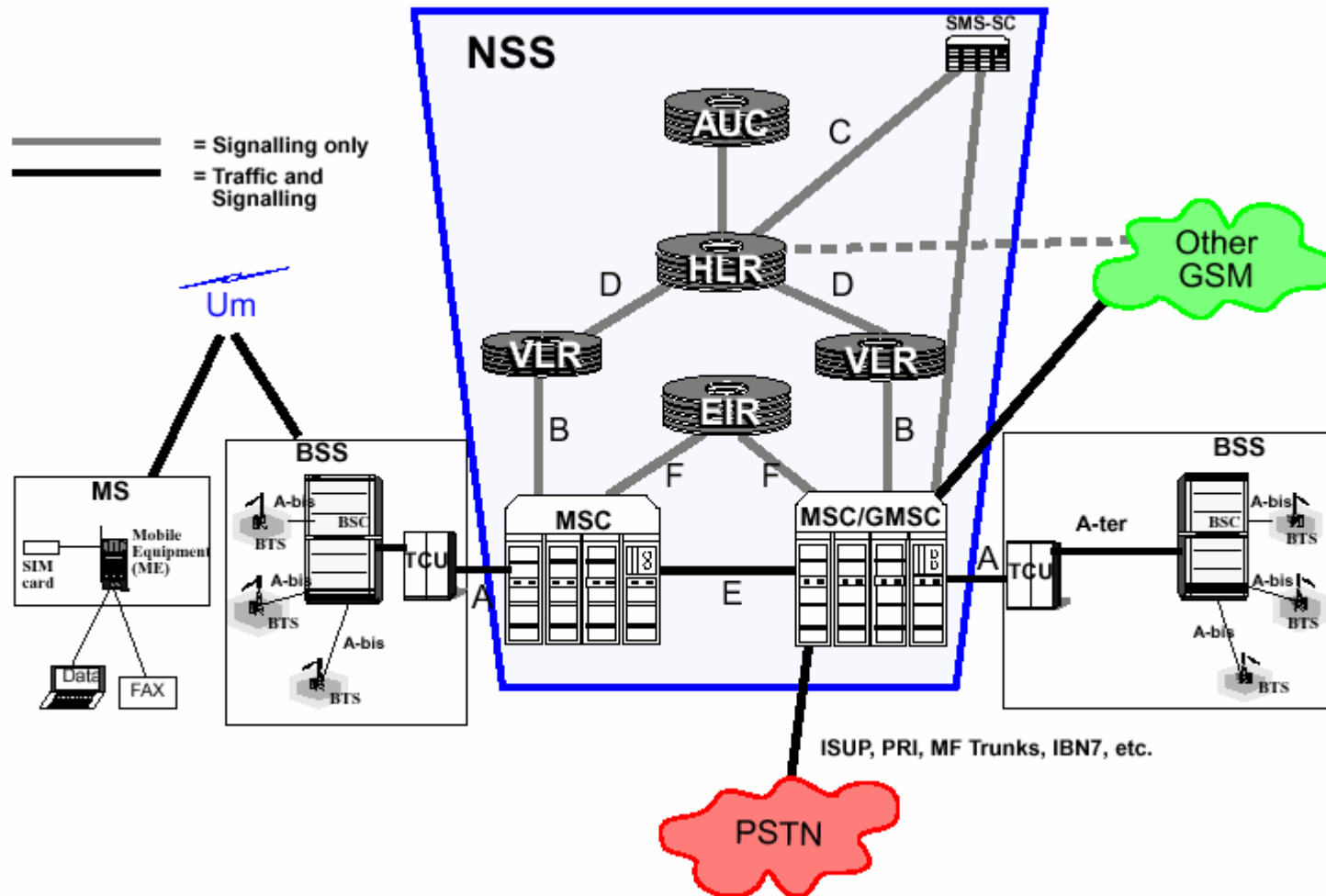
The need:

- Optimum spectrum usage
- More capacity
- High quality of service
- Low cost



I wish I could **increase capacity**
without adding NEW BTS!
What can I do?

GSM Functional Architecture



Course Overview:

Part 2: Principles of Resource Management

- ✓ Problem expected
- ✓ Existing solutions: 2G, 3G
- ✓ New approaches

Course Overview:

- ✓ **Part 3: Resource Management Tools**
- ✓ Traffic Modeling
- ✓ Access Control and Admission Control
- ✓ Mobility Management and Handoff Management
- ✓ MAC and Packet Transmission Scheduling

Course Overview:

Part 4: RM Practical Applications

- ✓ Resource Management in Packet Access
 - ✓ in Ad Hoc Networks
 - ✓ CDMA2000 & WCDMA (i.e., UMTS) Systems
 - ✓ 4G and beyond!?