

Broadband Technology

吳曉光教授
無線多媒體實驗室
國立中央大學

hsiao@csie.ncu.edu.tw

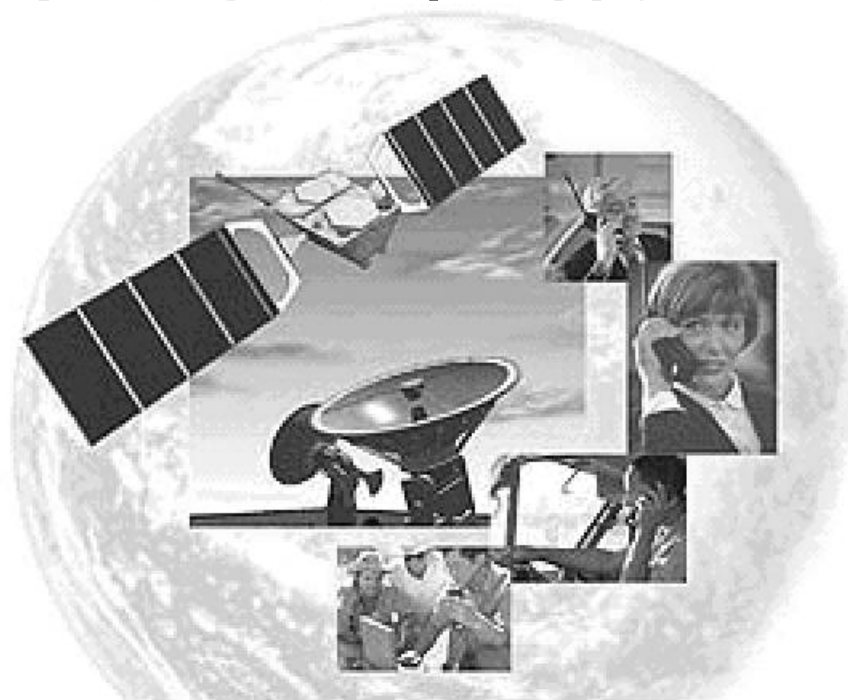
<http://nw58.csie.ncu.edu.tw>

Goal Of the Class

- Developing basic understanding of Broadband Technology
- Understanding the interesting research topics



邁向寬頻網路新世代



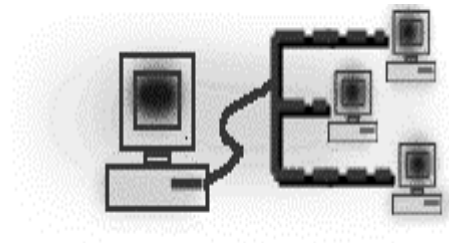
WE'LL HAVE THE WHOLE WORLD TALKING!

Multimedia Requirements

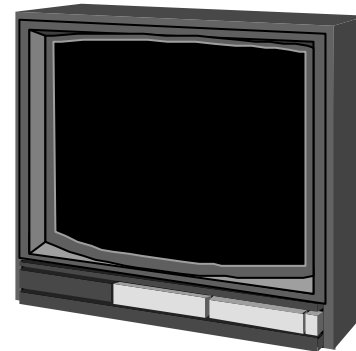
- ☑不同服務或不同使用者的排程優先權、頻寬分配等等問題
- ☑行事曆的決定



VOICE

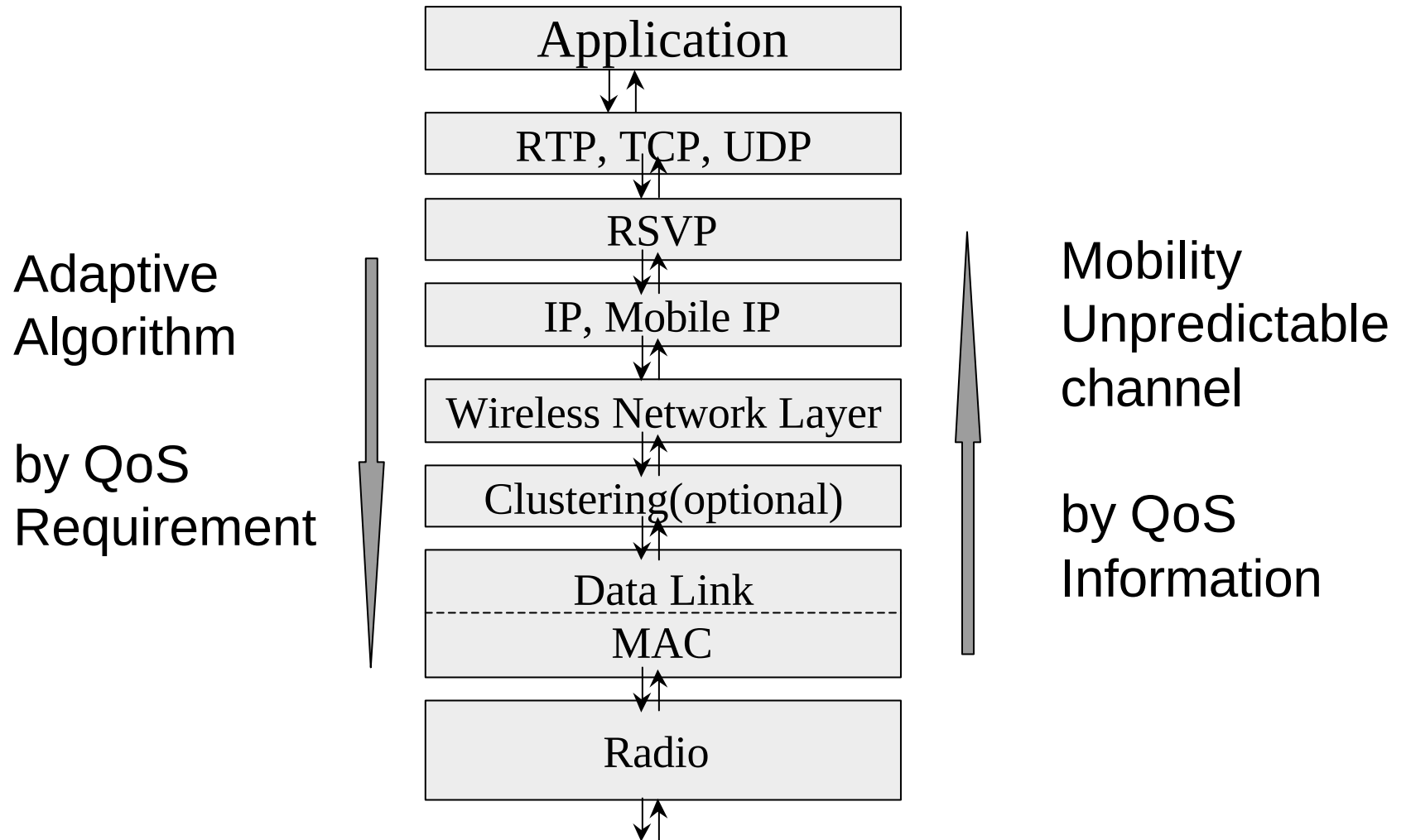


DATA



VIDEO

QoS and Multimedia Traffic Support



SOHO Working at home

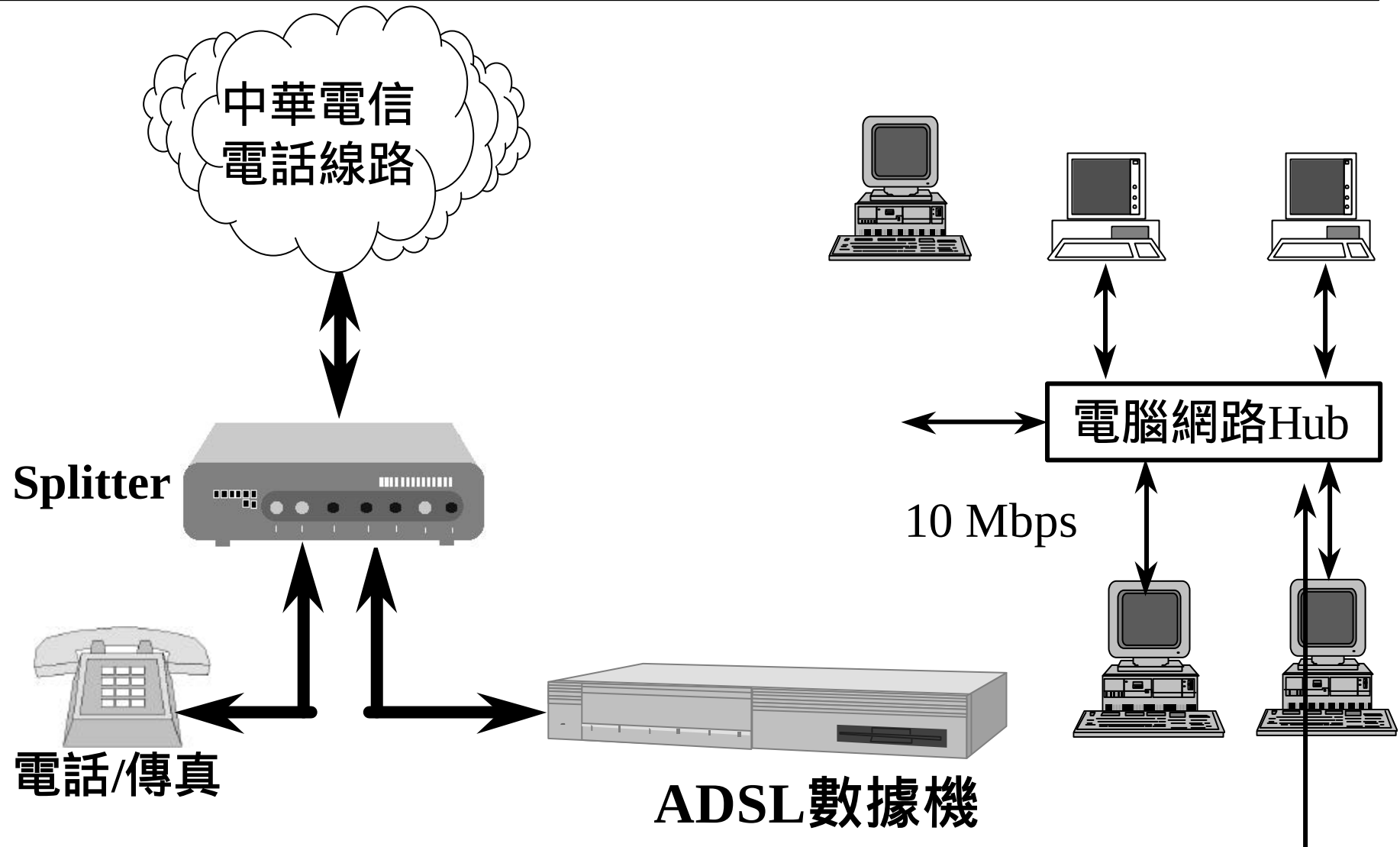
- Broadband Solutions to SOHO



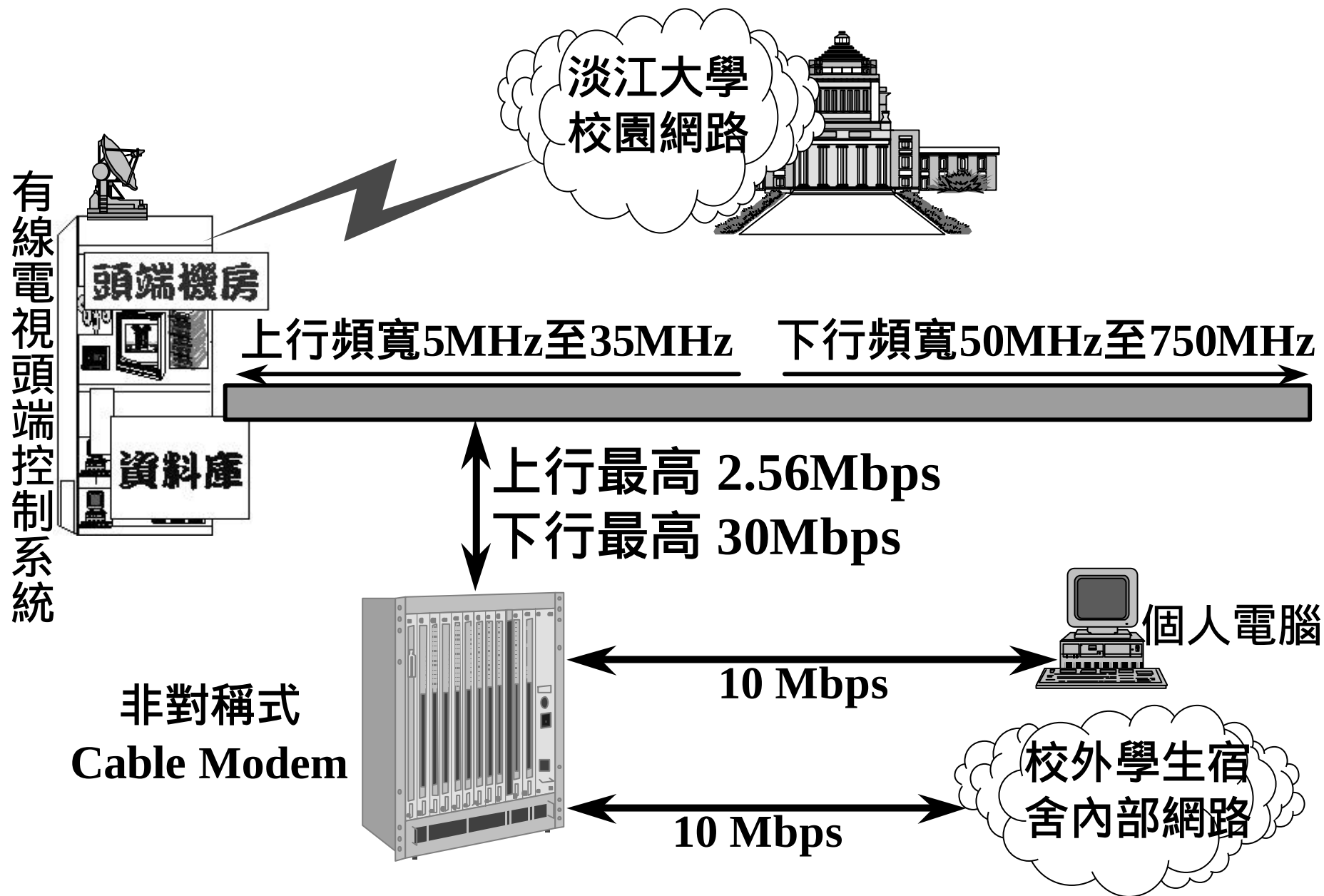
Current Competitive Broadband Solutions

- xDSL
- Cable Modem (CATV)
- LMDS (Wireless Transmission)
- DBS (Satellite Solutions)

校外ADSL學生宿舍 內部網路接線圖

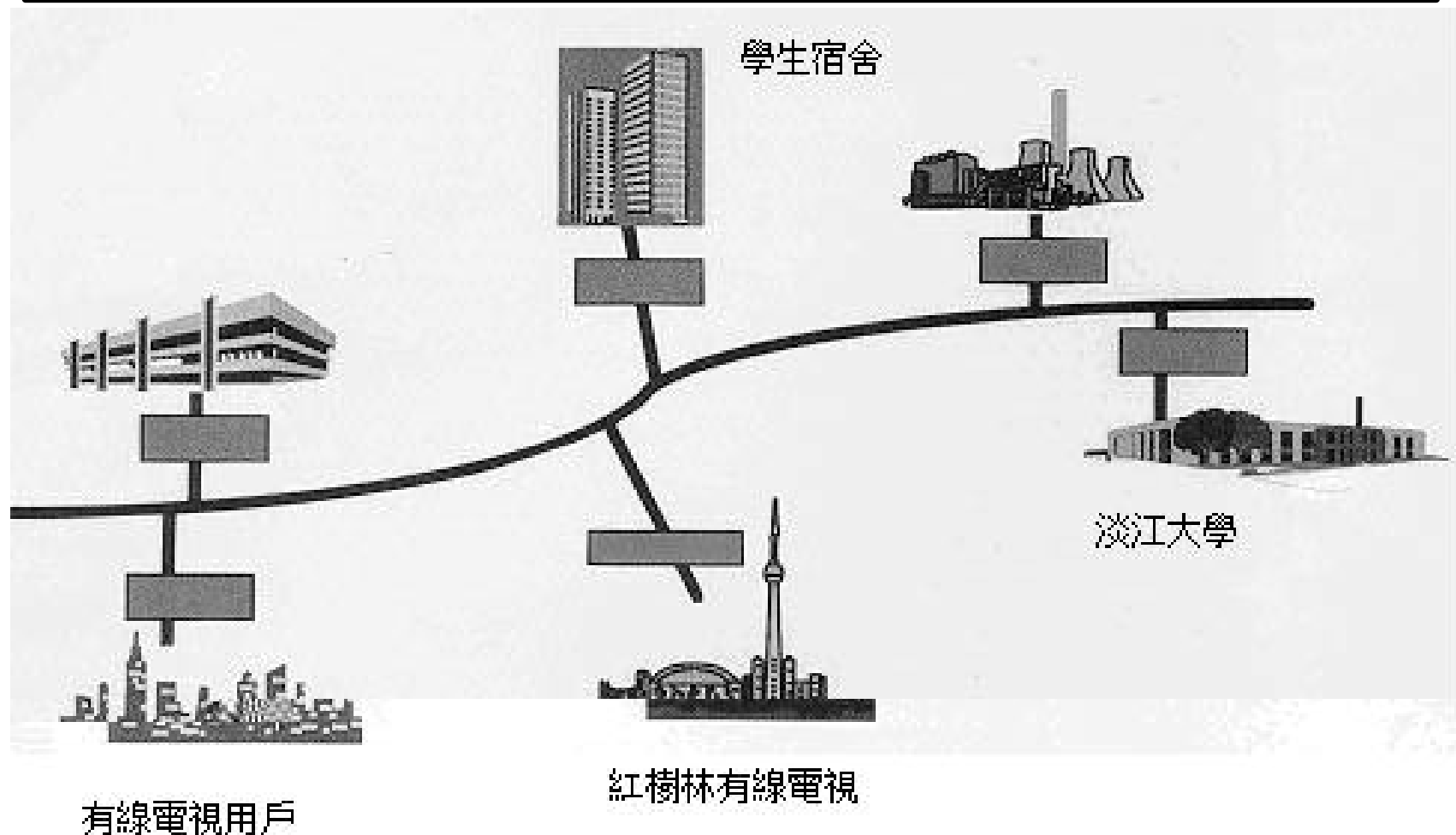


非對稱式Cable Modem系統

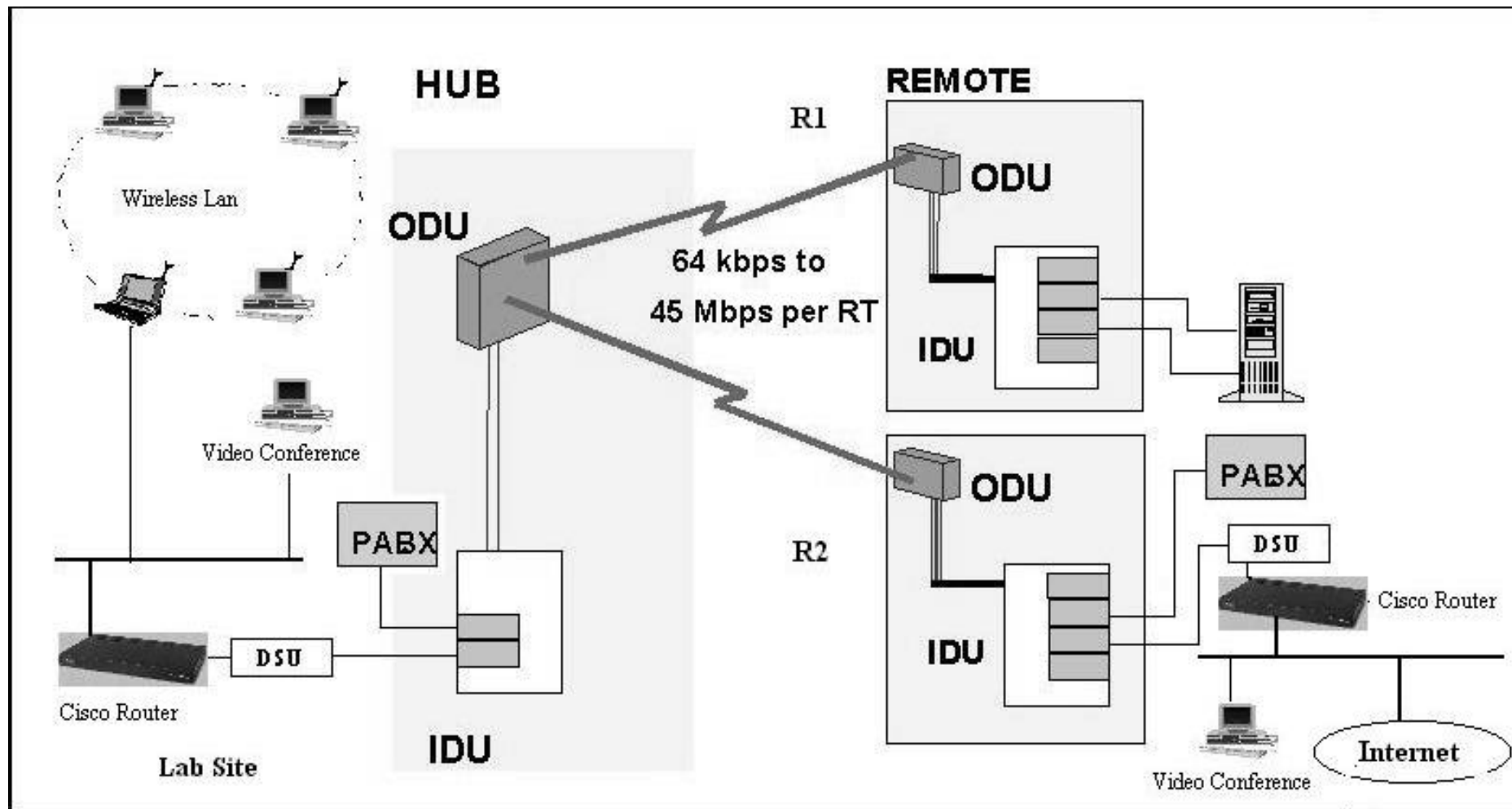


淡江大學

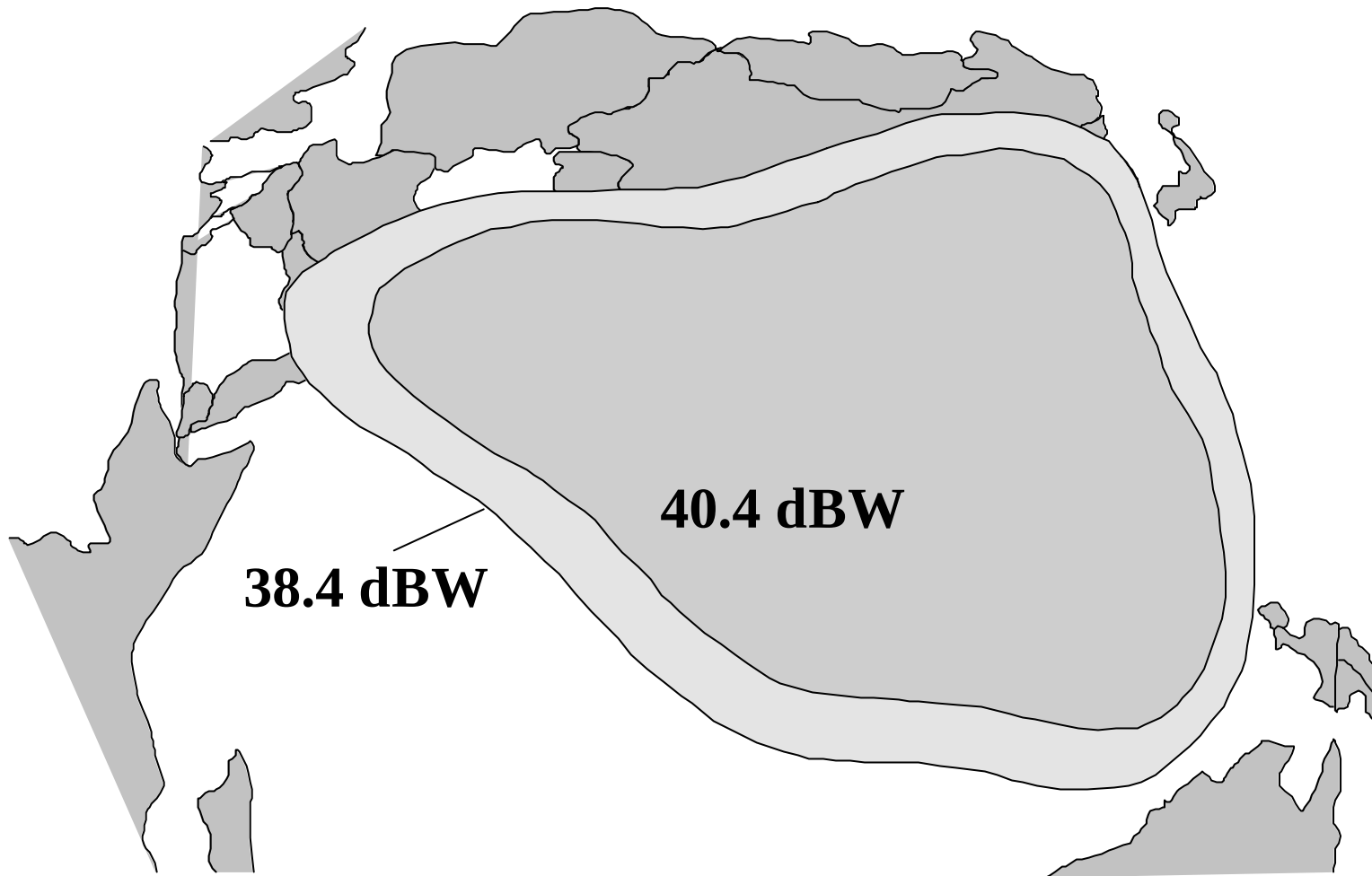
對稱式Cable Modem系統測試



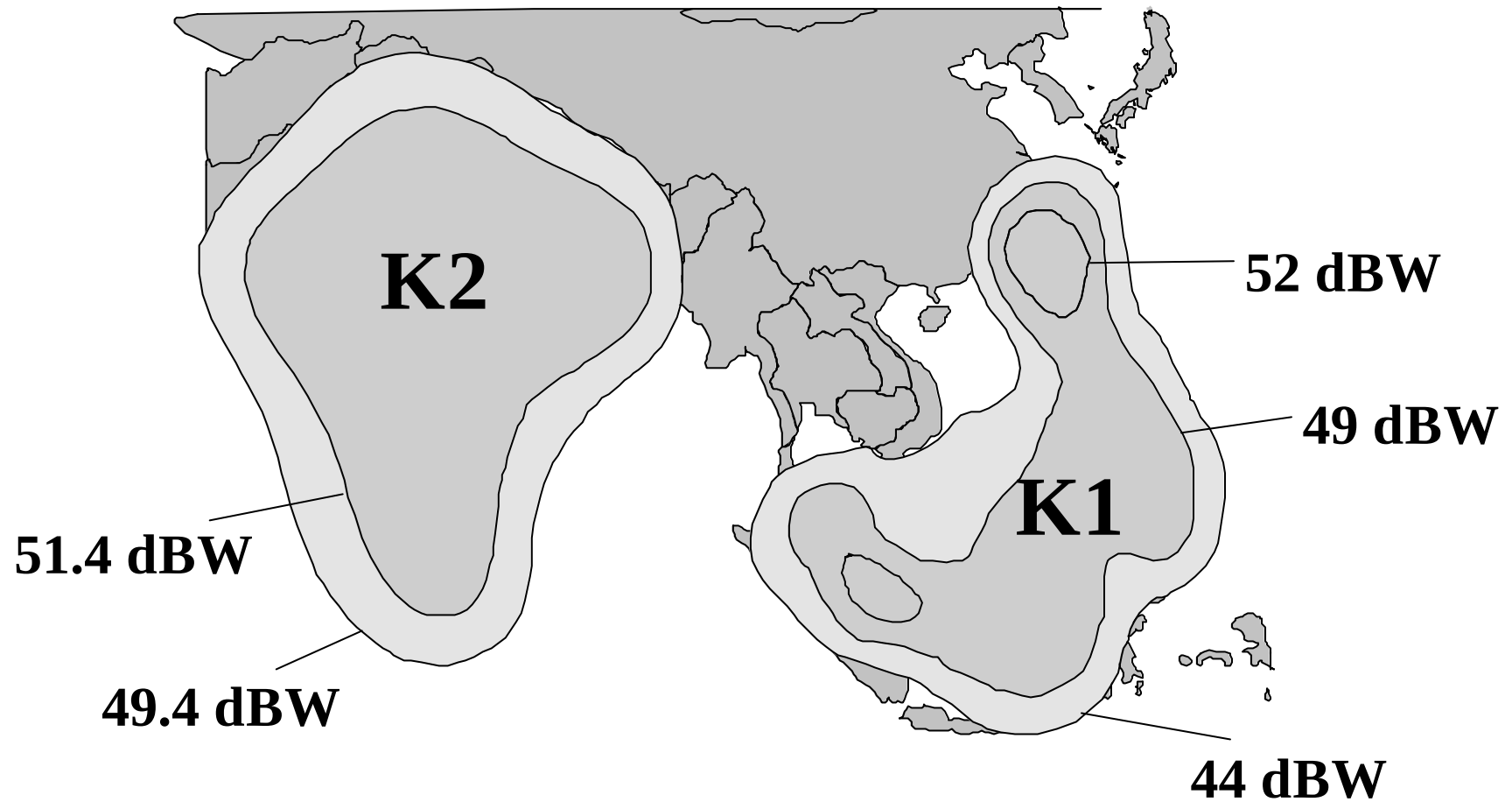
LMDS Example



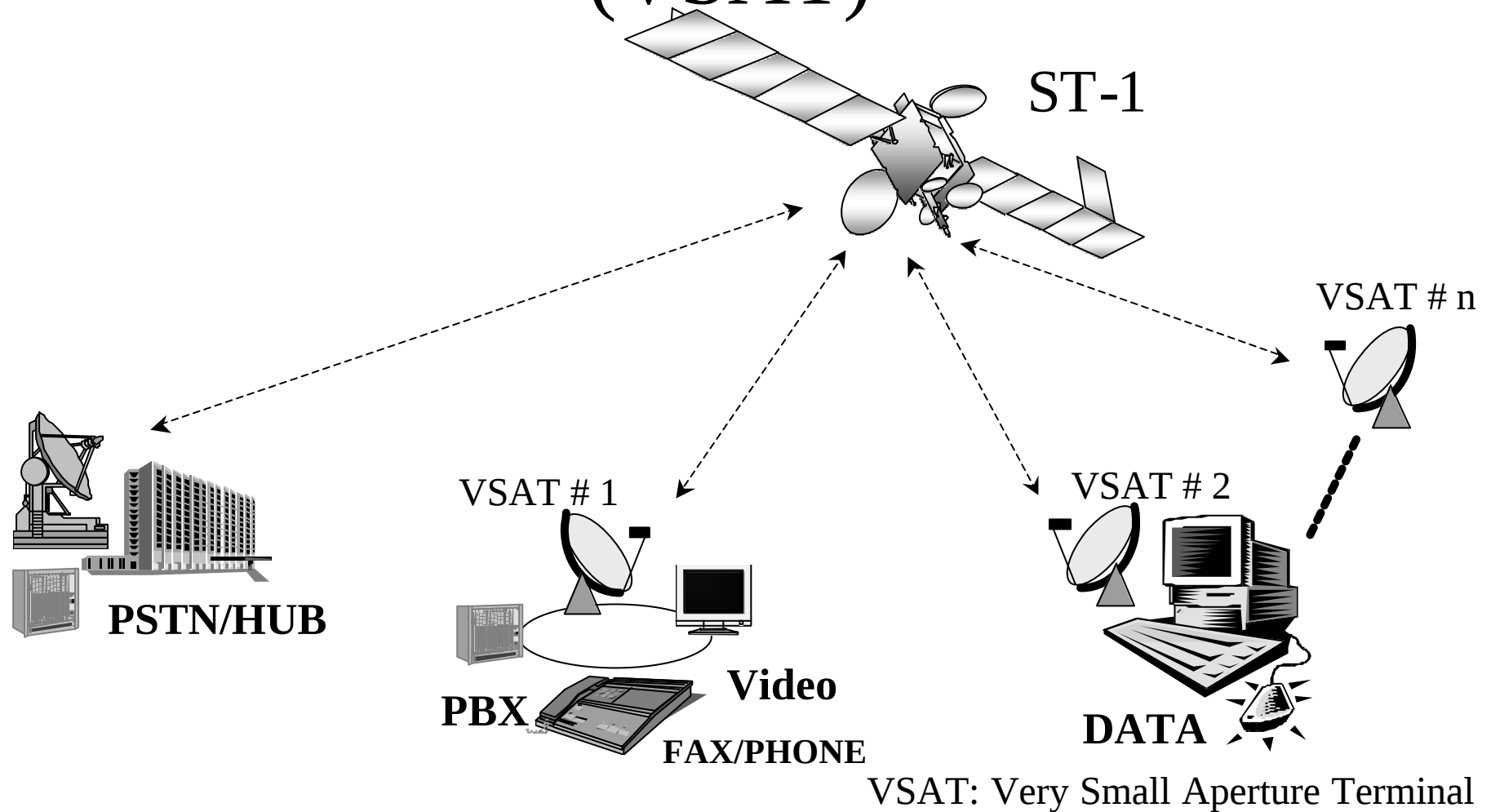
中新衛星(ST-1) C 頻涵蓋區



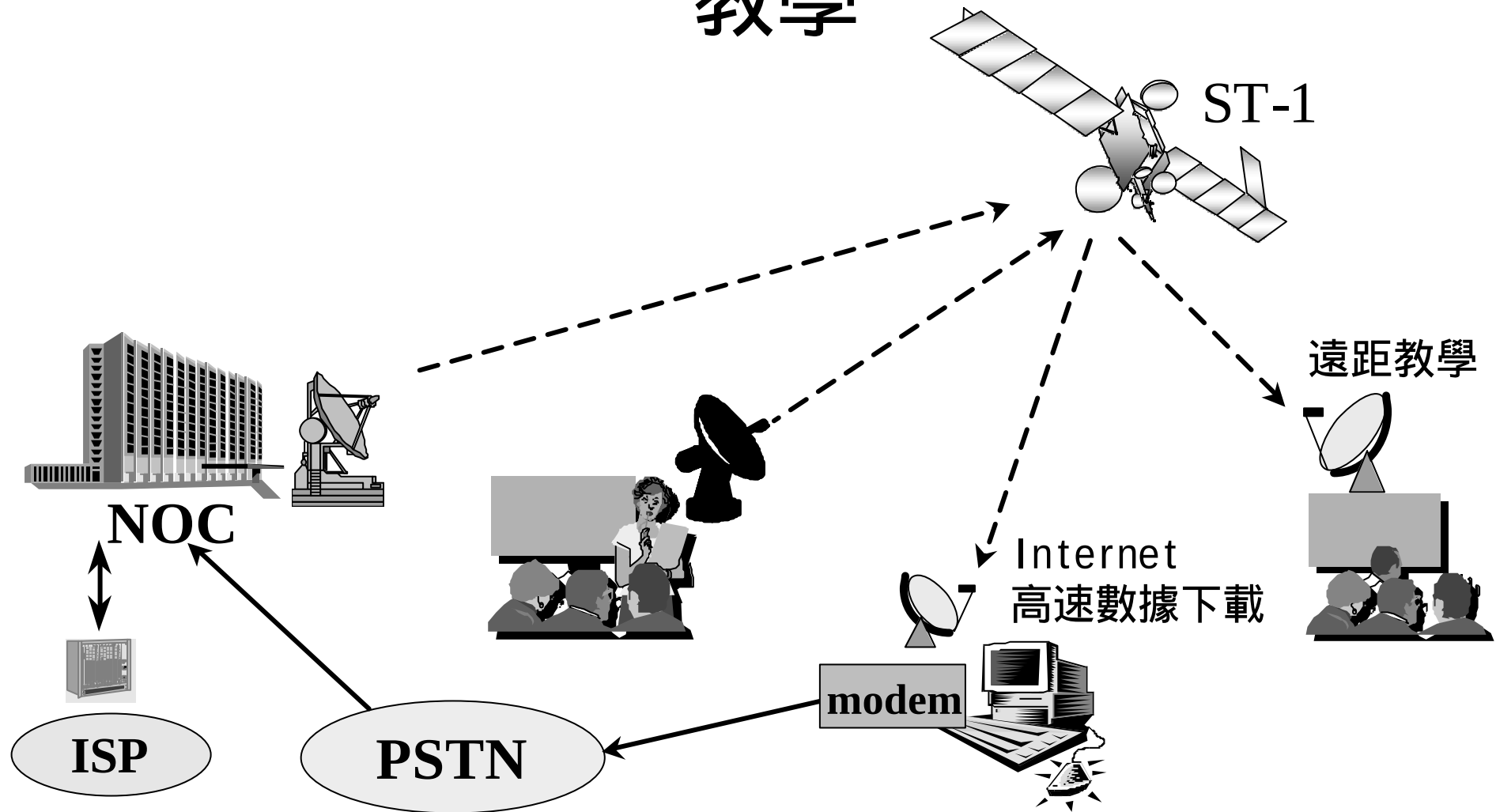
中新衛星(ST-1) Ku 頻涵蓋區



中新衛星(ST-1)應用: 衛星小型地面站 (VSAT)



中新衛星(ST-1)應用: Internet及遠距教學



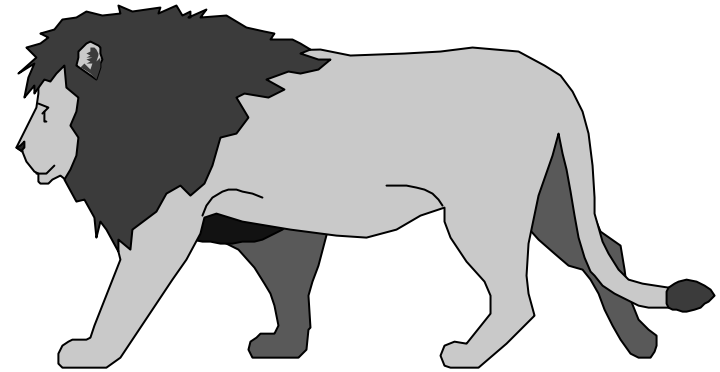
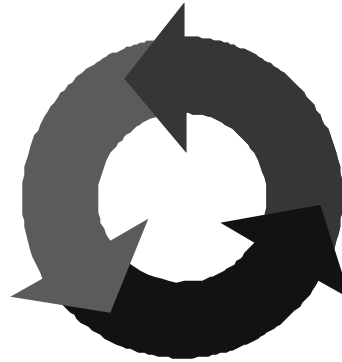
ISP Opportunities

- ISP (internet Service Provider)
 - IAP (Internet Access Provider)
 - IIP (Internet Information Provider)
 - IAPP (Internet Application Provider)
 - IHWP (Internet Hardware Provider)
 - ISWP (Internet Software Provider)
 - ICS (Internet Custom Service)
 - IPP (Internet Presentation Provider)
 - IRP (Internet Resource Provider)

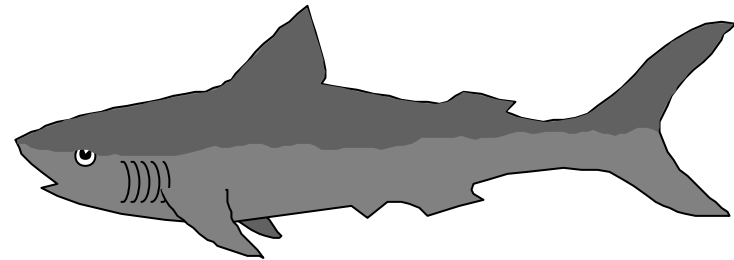
Different Approaches



Internet & ISP

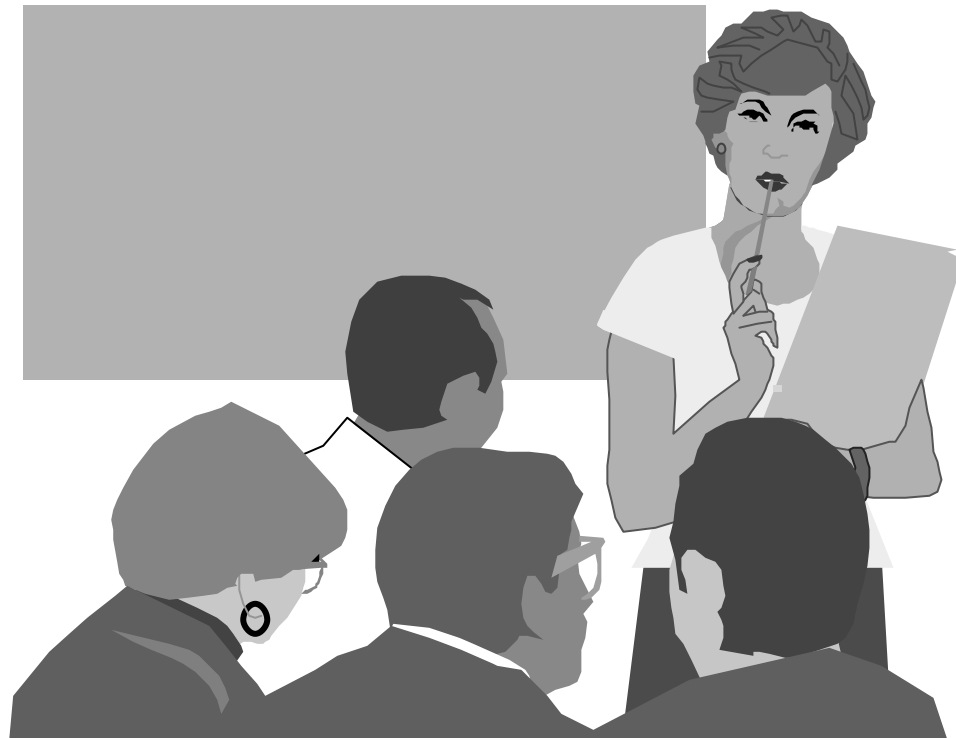


CATV



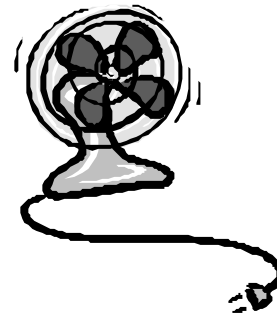
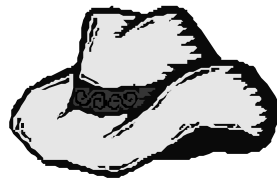
Telecom

E- Community



E Commerce & CRM

- E Commerce
- CRM (Customer Relationship Management)

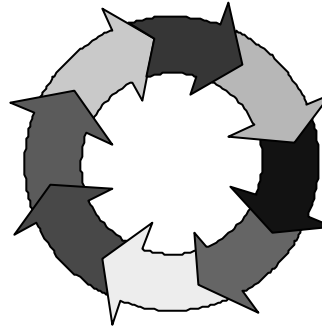


ON SALE

Broadband Technology

- QoS Support
- Transmission Characteristic
 - Unicast, Multicast, Anycast
- VPN (Virtual Private Network)
 - Load Balancing
 - CA/RA Certification
- Interconnection

Internet Opportunities



Broadband Technology

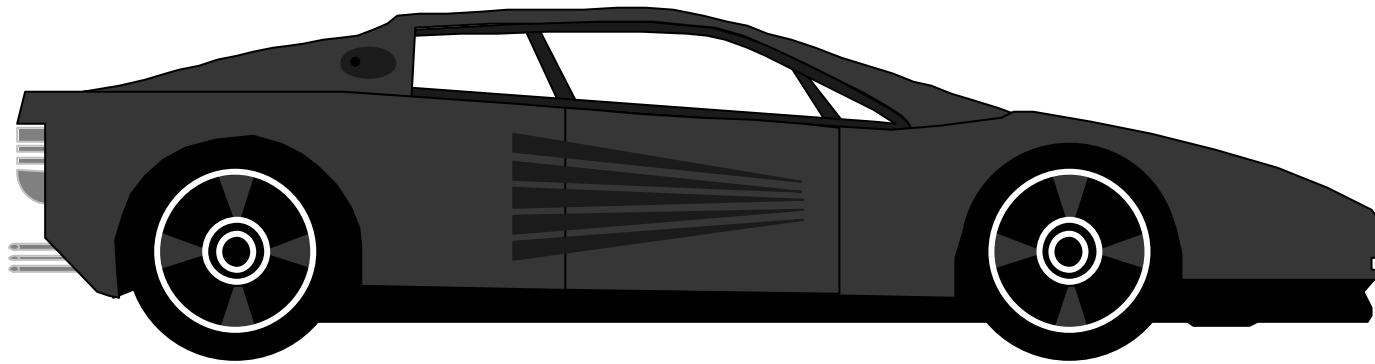
- QoS Support
 - End-to-End Solution
 - IntServe (e.g. RSVP)
 - DiffServe (e.g. Differential Service)
 - QoS Routing
 - IP Packet Switching

Broadband Technology

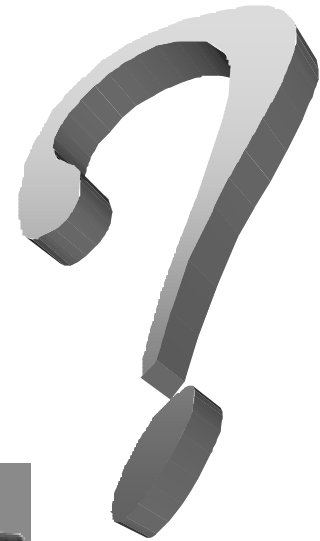
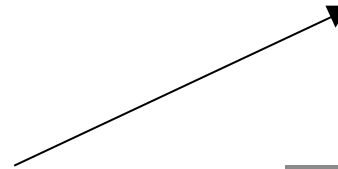
- Broadband Definition
 - Megabit (10 Mebabit)
 - Modulation and Compression
 - Compared with Baseband

Ubiquitous Access

- Wireless Broadband Solutions to Mobile Users



Third Generation Wireless Network

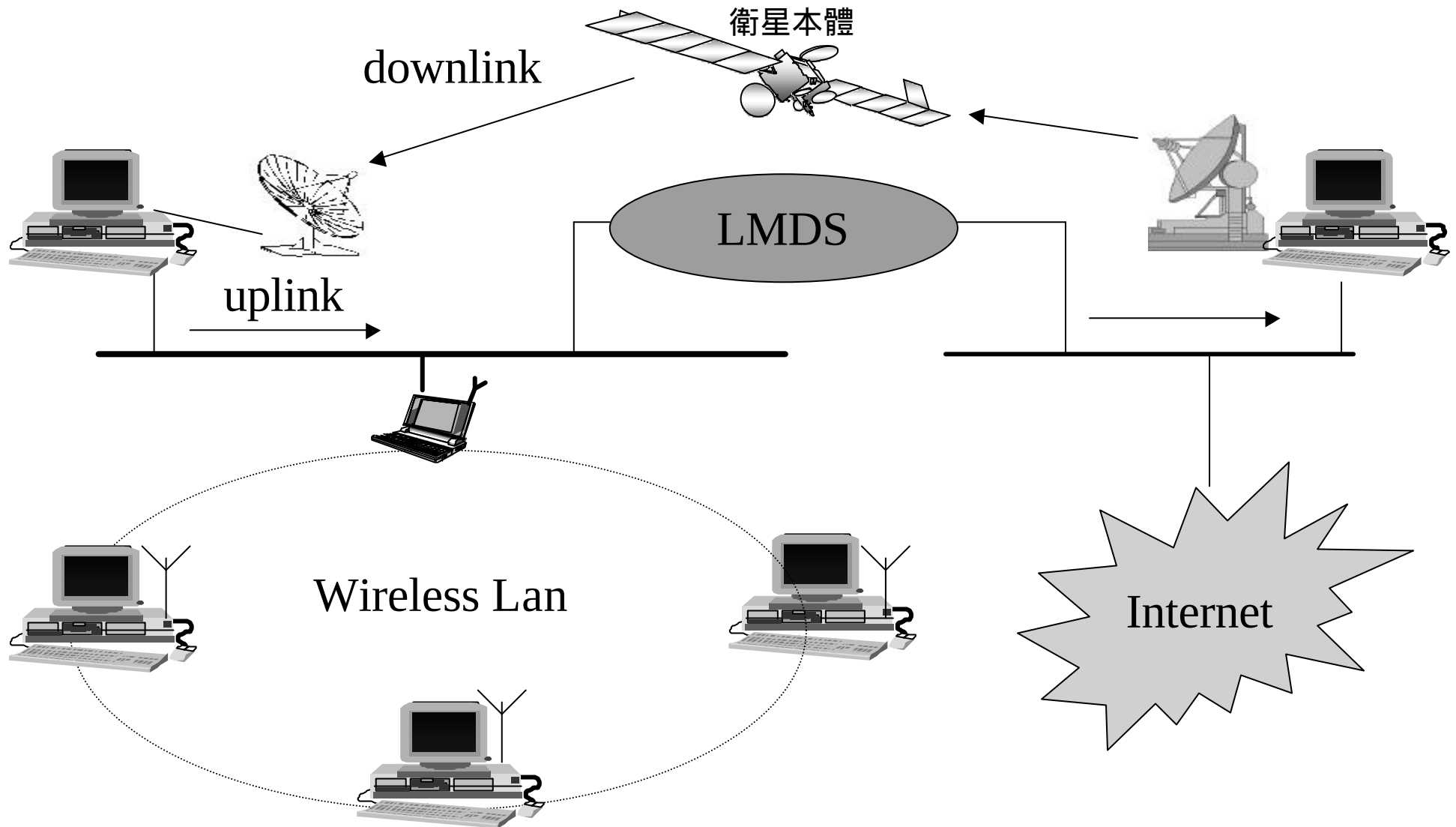


Experiments and Research

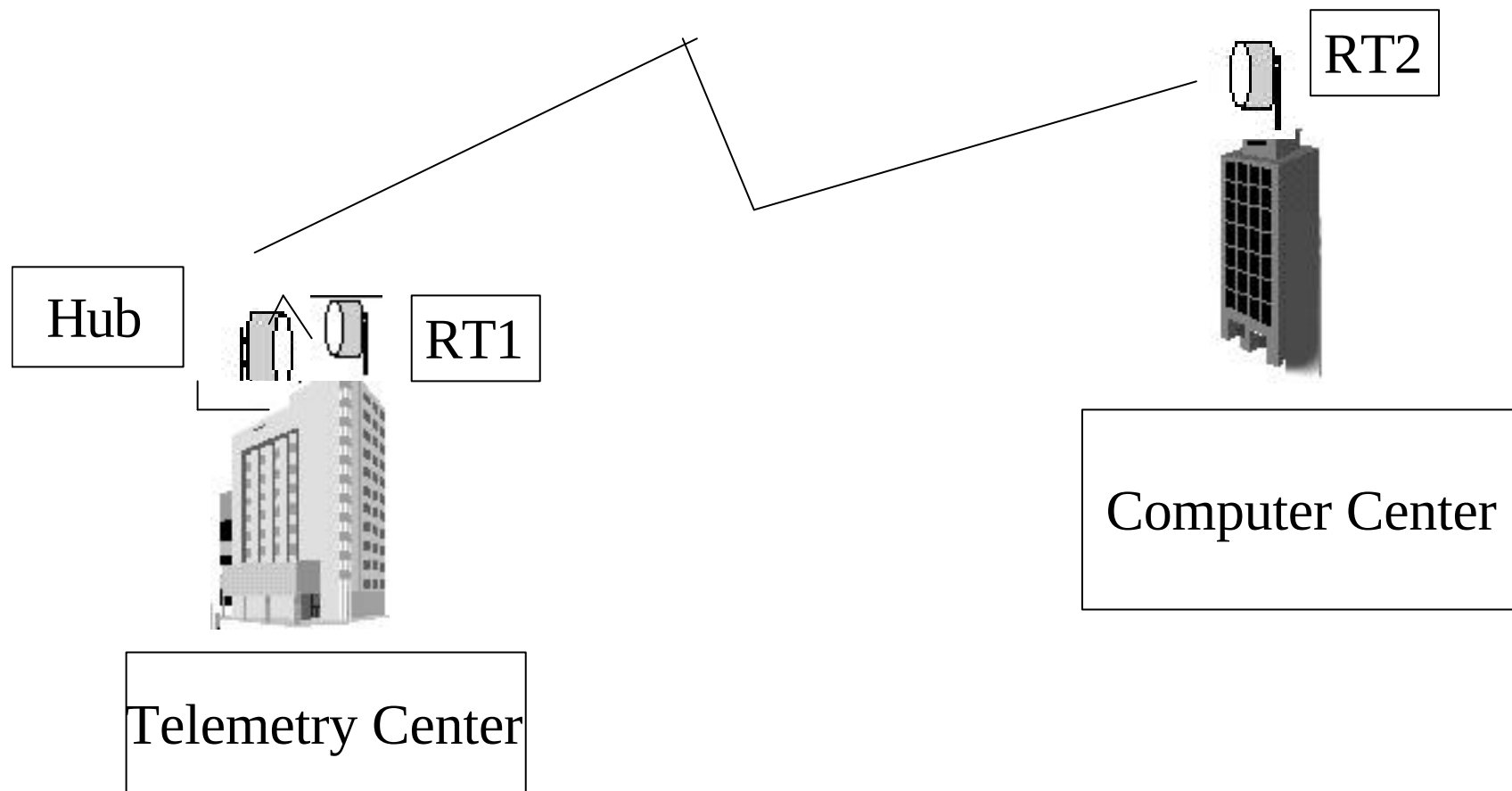
- **Two way video conference experiments**
- **IP network experiments**
- **Network Interconnection**
 - **Wireless LAN**
 - **Eithernet Experiments**
 - **Direct PC**
- **ATM interface experiments** (will be planned for the next LMDS with ATM interface delivery)



Network Interconnection



LMDS Deployment in NCU

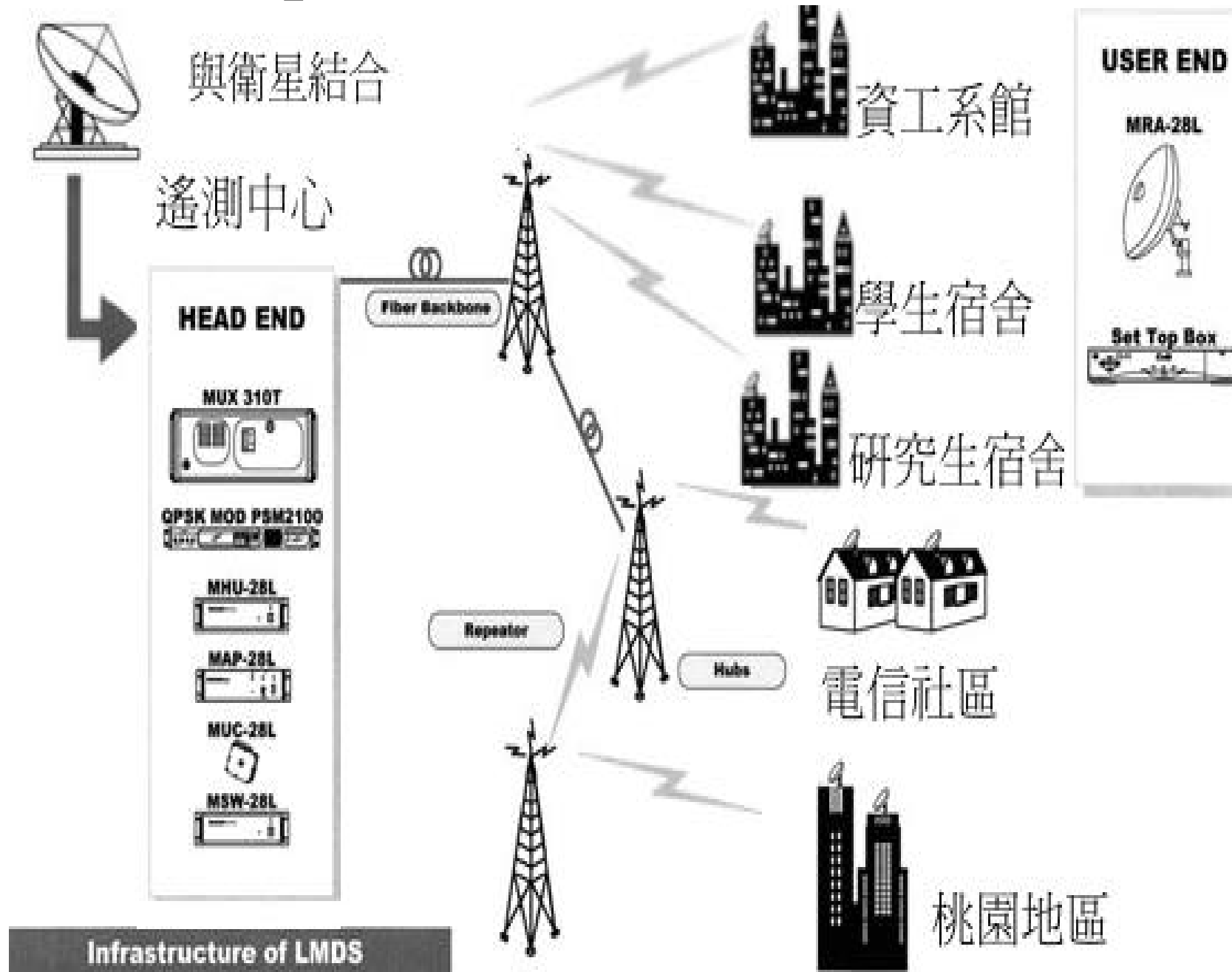


LMDS社區學習園

建構一個整合社區、學校、研究所的電
信社區學習園

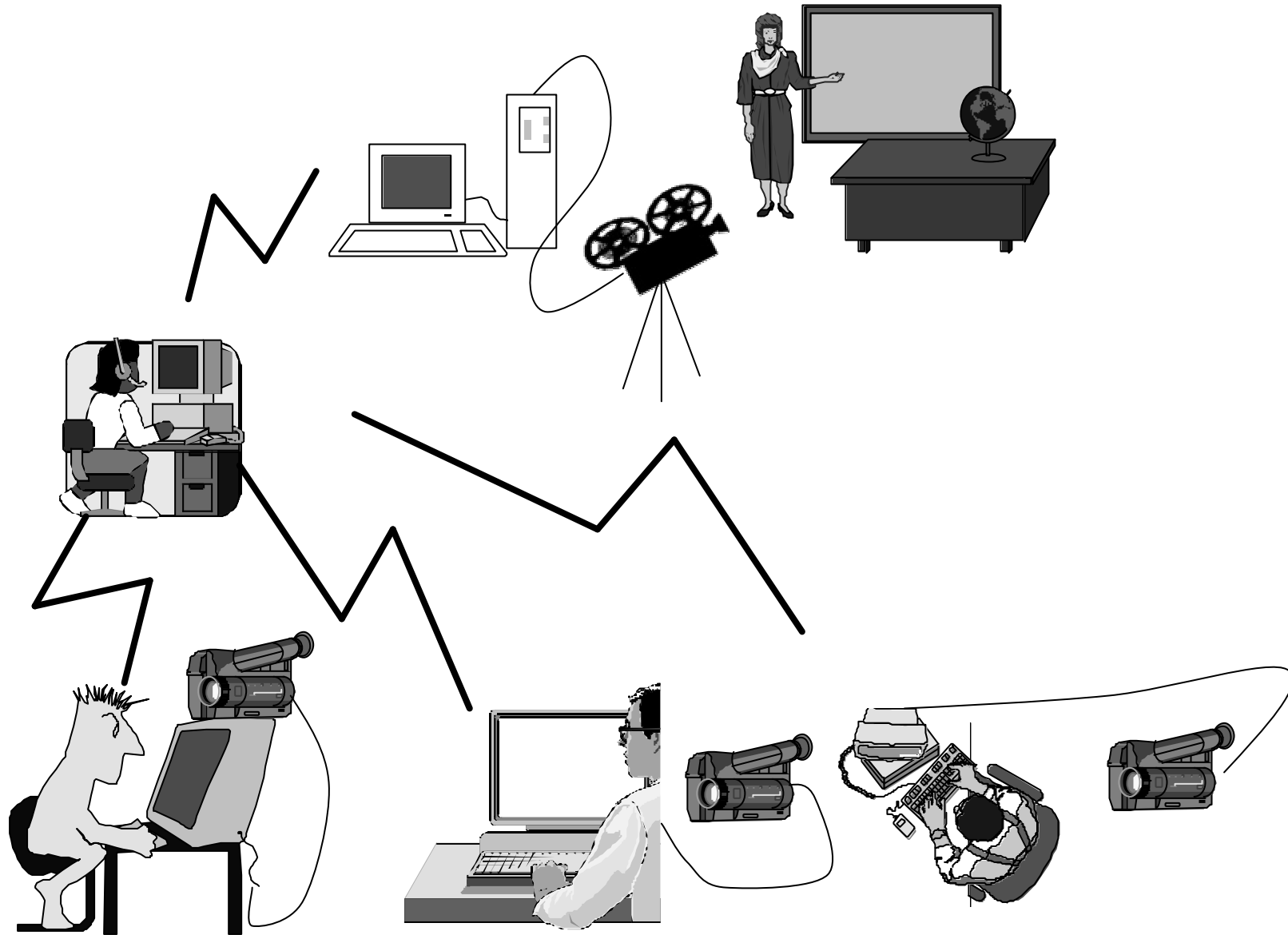
國立中央大學資訊工程系

Step.1 LMDS Architecture



Step2.多媒體學習

遠距教學real-time的架構:



Research Issues

LMDS for Distant Learning

- Scheduling question
- multiple access technology
- Transmission impact
- Base station placement

multiple access technology

- ☑對該區的資料量統計，決定該採 T D M A 或 F D M A 等.....
- ☑制定優先存取權規則

