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# RIPQoS: QoS at the bottom, or not at all !!

.The QoS Pall Bearers(\*)

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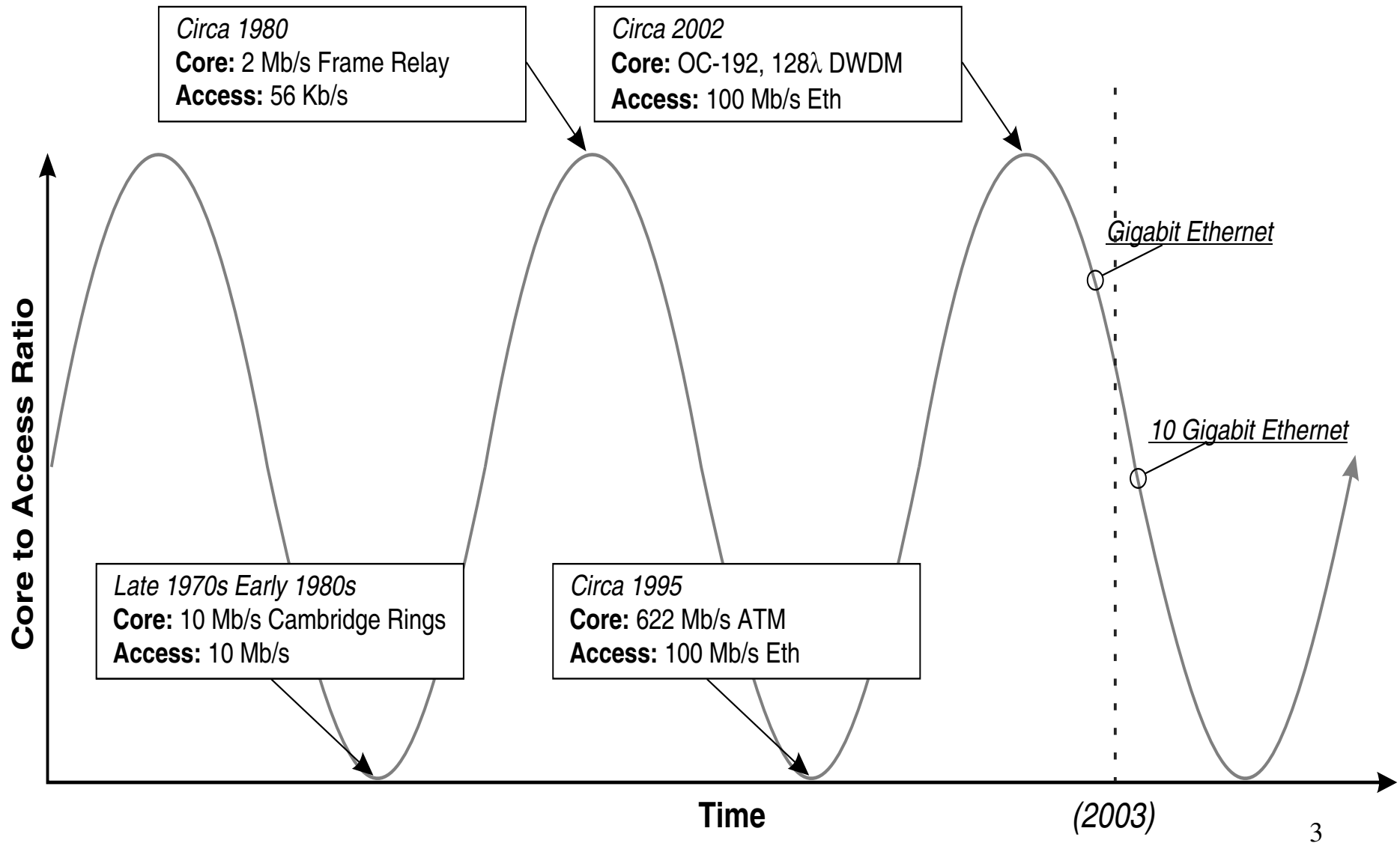
<http://www.cl.cam.ac.uk/~jac22>

(\* = Crowcroft, Hand, Mortier, Roscoe, Warfield)

# QoS: Pinned to The Wheel of Time

- ❑ QoS research tracks the imbalance in resources
- ❑ This imbalance cycles - like war and peace
- ❑ Period of about 20 years
- ❑ Most papers written on the downturn
- ❑ Least funding available on the upturn

# QoS History #101



# QoS History #201

- ❑ In each decade, there's a drive to improve either WAN or LAN
- ❑ That triggers a cycle in the next decade to fix the other bottleneck
- ❑ Because the computer and telecom industries are **NOT** converged:
- ❑ We end up chasing each other round in circles 😊
- ❑ Pretty soon now, 10GigE will start to deploy in sites by the 100 - then the 48 \*10Gbps WDM kit in the core is going to look pretty thin 😞

# Learning from History 1

- ❑ Those who don't learn from history are doomed to repeat it
- ❑ In this case, we have too short a memory (typical researcher in QoS does PhD, gets job in industry or academia, and 10 years later is supervising, or hiring PhDs, exactly at the wrong point 😊)
- ❑ Need to break cycle by looking sooner, or further
- ❑ We choose further 😊

# Learning from History 2

- ❑ History is Bunk says Ford
- ❑ Ford is dead, say we...
- ❑ So what should we do?
- ❑ Solution seems to be to build in something that is **SO** cheap (even cheesy) that no one in their right mind could object to (\*)
- ❑ Going back to 1 bit of QoS then, from the lowest level up
- ❑ Been shown (e.g. Peter Kim's thesis) can build both int and diff serve on 1 bit (2 level) priority system

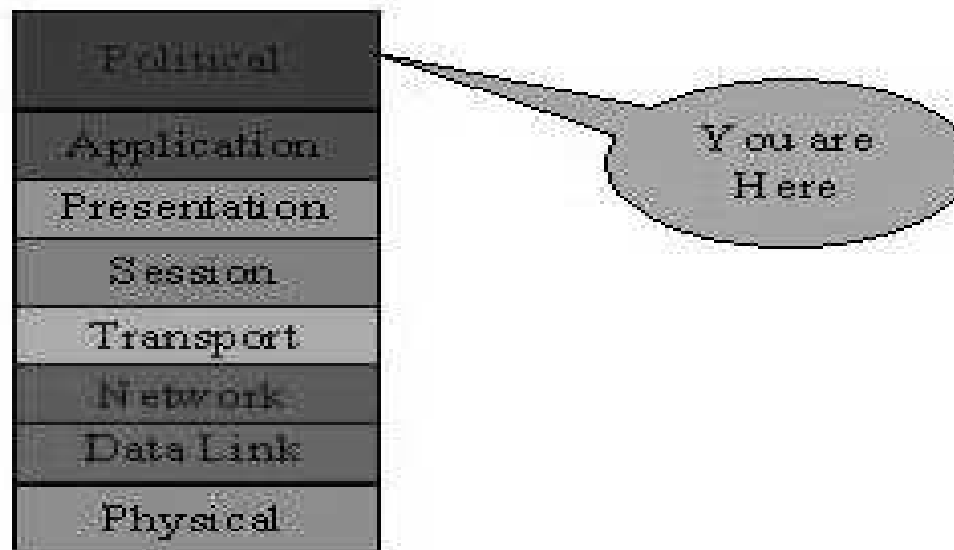
# Who (is) in their right mind?

- ❑ Stakeholders include
  - The user (a.k.a you a.k.a subscriber)
  - The ISP (a.k.a Service Provider)
  - The Vendor
  - The research and the developer
  - The Market
  - The Forum, the colluseum, the theatre etc
  
- ❑ Markets are not rational

# Where are we now?

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## *Eight layer model*



# What on earth do we do

- ❑ QoS at the bottom -
  - like PILC, and not like ISSL (explain)
- ❑ No more QoS
  - Architecture, Framework, System
  - E.g. mpls, b-isdn, int-serv, etc
- ❑ Mechanisms to map qos from
  - User/\$\$\$
  - App, transport, net, transfer *mechanism*
  - Mind the GAP 😊

# Efficiency

- ❑ May not matter - just so long as each link (or in case of ad hoc, wireless, each medium access) technique admits of some discrimination
- ❑ Rest of system , from IP/ATM up to level 8 (price based admission control and other economic techniques like preferential route choice by price) can be layered on top
- ❑ Without this, we are doomed to go around another futile cycle

# Questions?

☐ Thank you...😊



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