

EDUCAUSE 2000 Current Issues Roundtable: HOW MUCH NETWORKING IS ENOUGH

Discussion led and written up by Philip Long, Yale University.

DISCUSSION

- Understand demand
 - Emerging broad band demands such as video conferencing
 - Gaming, entertainment activities
 - “Ubiquity” of small demand applications (e.g., email, MP3) equals high demand
 - Importance of user support in proportion to expanded demands, particularly with new applications
 - What will expand institutional participation?
 - “It’s the applications, stupid!”
 - Rising end-user expectations: faculty, students, parents (!), staff
 - Campus culture greatly affects end-user expectations
- Understand network management options
 - Some applications are educationally related, others are not => need to manage?
 - History of modem pools as useful exemplar for demand that exceeds supply and the precedent and need to manage
 - Differential service, quality of service
 - But IP contains no underlying QOS capabilities
 - We will have to live with this reality
 - Any tools for traffic shaping?
 - Coarse or fine grain filtering by source IP or port
 - Policy based management: develop bandwidth limits and monitor “loud talkers”
 - needs well publicized standards on “appropriate network use”
- Understanding capacity expansion options
 - Fiber to the desktop
 - Continued advances in speed
- How much networking is enough
 - Keep ahead of demand?
 - Conform to budget?
 - Meet peer practice?
- Critical question: How do these variables interact?
- Satisfactory networking is an interaction of at least three variables:
Demand
Capacity (including function)
Cost
 - An institution can control any two independent variables
 - but the third will then be uncontrolled
 - For example, if an institution wishes to expand capacity to meet demand
 - cost must be unconstrained
 - If cost is to be constrained, then
 - demand or capacity must be controlled

CONCLUSIONS

- Demand for networking continues to expand, driven by:
 - new program activities such as distance learning, expanded online use by traditional teaching, expanding numbers of cross institution projects (e.g., federally funded) and much more
 - new communications capabilities such as voice-over-IP, IP based vide conferencing and much more
 - improved function such as higher resolution images, bigger screen video

- changing use patterns favoring persistent connections over periodic connections
- rising user expectations for reliability and speed
- rising numbers of connections per user
- ability of machines to talk to each other, exploding the number of addresses, sources and destinations
- crude options are available for managing demand
- blocking sites or ports
- establishing local policy on bandwidth limits and policing
- Capacity continues to expand based on new technologies
 - and, of course, by increased investment
- Value continues to improve based on communications costs tracking the classic Moore's Law improvements in the underlying electronics
 - But, despite improving price performance, overall network costs continue to rise
- No "visible or invisible hand" is guiding coherence between demand and capacity. Each school needs to establish its own balance of demand with capacity based on local campus culture, budget and related factors.
- What to do?
 - Take whatever steps appropriate to the local culture to manage demand
 - Plan ongoing expansion of network capacity (and budgets) based on campus cultural assessment of "legitimate" needs
- These steps can only be undertaken successfully in the context of a robust planning process
 - Strong faculty participation
 - Full professional staff support
 - Highly visible process
 - Highly visible, well published outcomes including reasoning
 - Educational campaign for end-users on policy and plans