

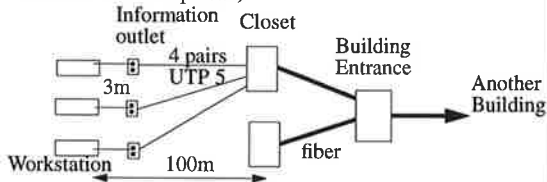


SLAC Structured Wiring Plan

SCS Network Operations & Development

What is the Proposal:

- Rewire 4 major[†] buildings[‡] following modern "Structured Wiring" standards^{††}.
- This allows wiring without any knowledge of data communications equipment that will use it
- Consists of shared fiber between buildings and between closets, plus Unshielded Twisted Pair (UTP) Category 5 cables from closet to desktop
- Each link from the closet to the desktop is dedicated to the "workstation seat", unlike today's shared media (e.g. RG58 "Thinnet" multidrop coax)



†. 56% of Ethernet taps are in these buildings
 ‡. CL, CLA, CGB, A&E
 ††. EIA/TIA-568 Standard



Costs

Roughly \$655K, or about \$600 per workstation seat one time cost assuming 50% occupancy or \$300 per seat fully populated

Includes cable, installation, termination, patch panels, hubs, racks etc.

Supports up to 2220 workstations

Provides nearly 100% growth capacity



Savings

Today adds/moves/changes cost about \$400 on average

Per year we do about 600 adds/moves/changes per year or about \$130K for these 4 buildings, or payback 2.5 to 5 years.

Reduce time user has to wait for an install, this is a constant user concern (see SLUO minutes for example)

Improved scheduling of outages since only affects one workstation as opposed to several on today's shared media:

- Less overtime
- Reduce loss of productivity of users due to outages

Much improved trouble-shooting and isolation, with reduced scope of problem, faster isolation, better diagnostic tools - reduces expert time and expertise needed, and increases user productivity

Enable management of increased net size without increased staff

Remove increasing needs to run new cables to an office in order to support a different workgroup with different security, access requirements, and to manage bandwidth requirements

- Connection can be moved to another workgroup at patch panel or via network software



Why Do Anything?

Today's 10 year old technology cannot meet demands:

- **Increased # of stations on network (increase of 50%/yr for last few years, now need to accommodate VM migration)**
- **Increased bandwidth - need factor 2 increase per 18 months (factor of 10 in 5 yrs), driven by workstations and applications**
- **Increased dependence on network and availability requirements**

Why current cabling technology cannot meet demands:

- Multiple devices sharing one strand of cable, makes isolation of problem impossible and pin-pointing source costly
- Poor connectors or cable plant^{††}
- Older media can only be used for a single purpose
- Older media can't support new application/workstations^{†††} which need > 10 Mbits/s
- Extending net size with old technology is not maintainable with current staff, resulting in increased unreliability

††. "Most of today's network problems are traced to the cable plant"

†††. E.g. Postscript displays, WWW, multimedia, video conferencing, physics data mining, interactive analysis for B Factory, GIS, CAD etc.



Why Now?

Standards are in place, agreed upon and supported by vendors

- Multiple sources, competition, interoperability, reduced costs, improved agility

Standards should meet requirements into the next century, so multi-year payback

We have tested & understood technology using pilots:

- Warehouse uses UTP cat 3 (prior to standard)
- Several new buildings/trailers (B120 ext, B241, B242, B248), parts of CGB with UTP cat 5, new Physics & Engineering building

The longer we wait, the more wiring will need to be ripped out in next 5 years and redone, thus paying the piper twice

Demands have outstripped the current technology

- Current network running out of capacity and near edge of envelope
- B factory needs starting to take off
- VM migration

27
20
180
2