Report of the APS Information Services Review Panel to the Executive Board of the APS

APS IS Review Panel†

September 11th, 1993

Outline:

- History
- Panel makeup
- Charge

- Recommendations
  - General
  - Communications
  - Databases
- Concerns

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†. Presented by Dr. R. Les. A. Cottrell, chairman of Panel

Assume foundation of report,
Detailed History in handouts
Main milestones shown in graph of time vs Email flow.

History

Indicates heavy use of Internet to create & report

Late June '93, Richter asks Cottrell to come up with names of people to serve on an APS computing Review Panel.

Jul-13: Review Panel membership approved

Jul-21: Charge to Panel completed, date of meeting fixed

Jul-23: Panel member added to address database issues

Aug-5: Written review material received by Panel from APS

Aug-6: Change in membership, database person has a conflict

Aug-10: Agenda set up

Aug-16: AAPT, AIP, APS staff present requirements and plans to Panel at ACP.

Aug-17: Panel creates 1st draft of report and presents to Lustig & Lerch at ACP.

Aug-20: Second draft of report sent to APS

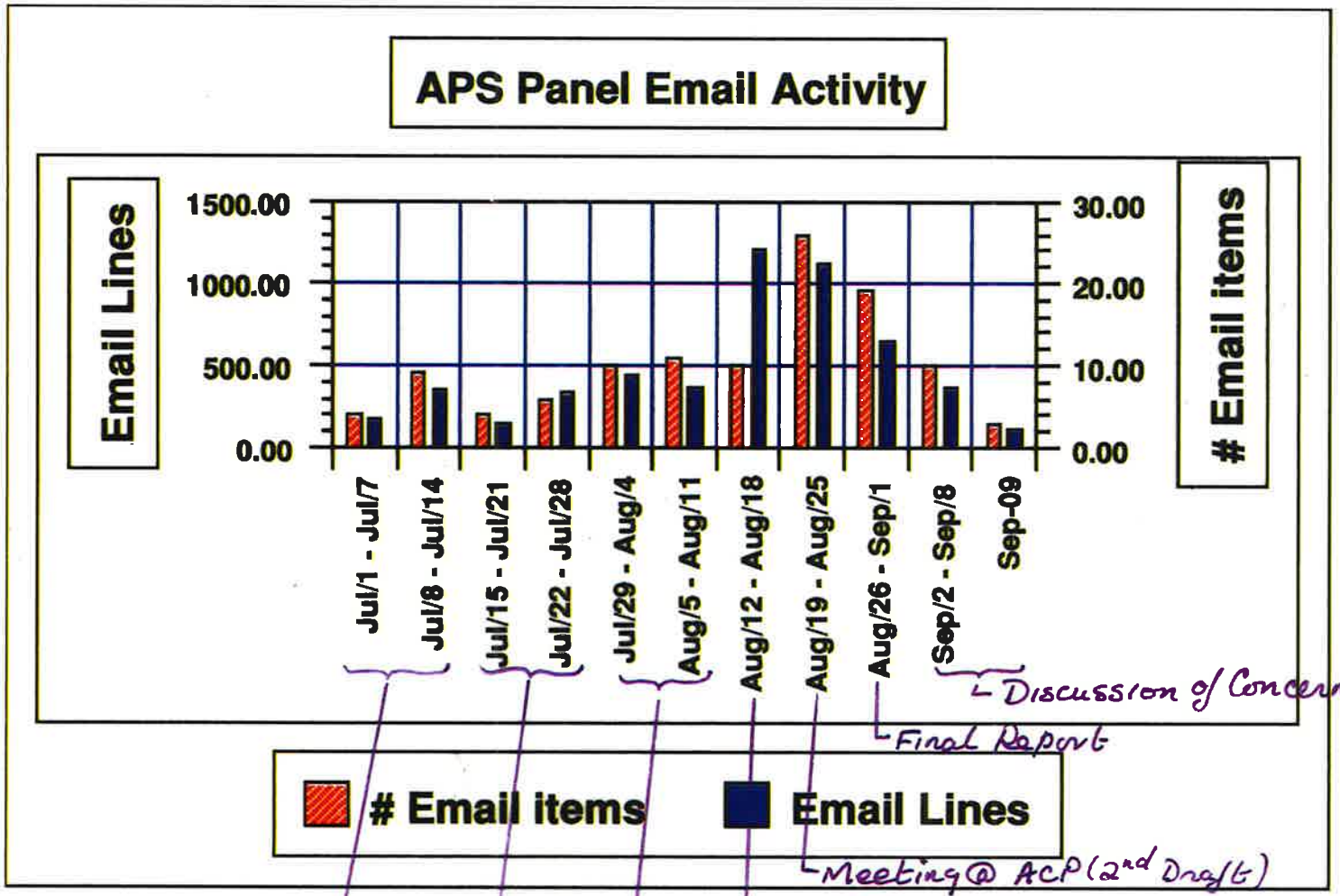
Aug-22: Presentation to ACP Board of communications recommendations, Panel representated at meeting

Sep-1: Final report to APS, incorporates feedback from ACP mtg

Sep-2: Cottrell briefs Richter on report.

Sep-11: Presentation to APS Board in NY

Email Lines


APS Panel Email Activity
Email Lines
1500.00
1000.00
500.00
0.00
30.00
20.00
10.00
0.00
Email items
Jul/1 - Jul/7
Jul/8 - Jul/14
Jul/15 - Jul/21
Jul/22 - Jul/28
Jul/29 - Aug/4
Aug/5 - Aug/11
Aug/12 - Aug/18
Aug/19 - Aug/25
Aug/26 - Sep/1
Sep/2 - Sep/8
Sep-09
Discussion of Concerns
Final Report
Email items
Email Lines
Meeting @ ACP (2nd Draft)
Meeting @ ACP (1st Draft)
Agenda set up
Charge Completed
Panel formed

Chosen to address main items in charge
& on E. Coart to

Panel

Chairman:

Les Cottrell, Assistant Director, SLAC Computer Services

Members:

Eart Coart to facilitate future interactions

Jeff Balling, Executive Director, SURAnet

Jim LeMaire, Finance Director, CEBAF

Richard Rose, Director TSO, UMSA

Roy Whitney, Head of Computing, CEBAF

You have seen the charge - Basically 2 areas

Charge

- Web subs & relevant is applicable
- Data base

Does not cover

- What is the best way to handle electronic communications (external and internal) at the new ACP in College Park, Maryland?
- How should the APS organize its Information Services (IS) at College Park to most efficiently handle its existing membership and accounting systems and to undertake new services, such as electronic meetings registration?

Did not cover:

- *Electronic publishing*
- *Phone system*

SKIP

Recommenations: General

The recommendations address the two areas specified in the charge:

- Communications, i.e. LAN/WAN networking and network Apps
- Informations Services (IS) or databases

In both areas made:

- technical recommendations
- and staffing recommendations

Will Return to * items under Concerns

Recommendations: Communications

- Consolidate the routers and Internet connections at Woodbury, Ridge and the ACP sites.
- Increase the Internet bandwidth between the above sites.
- Consider providing redundant backup Internet connections.
- Provide E-mail to personnel at the ACP at their desktop.
- Provide personnel at ACP with access to Netnews and information exploration tools such as Gopher and WWW.
- Provide access to APS information via Netnews and information exploration tools.
- Explore computer-supported cooperative work tools and stay current with developments in video conferencing technology and products,
- Approximately six to seven FTEs are required at the ACP to support systems administration, LAN/WAN support, and Network Applications. These staff should be consolidated under a single reporting structure.

Figure 1: Original Plans for ACP Wide Area Networking

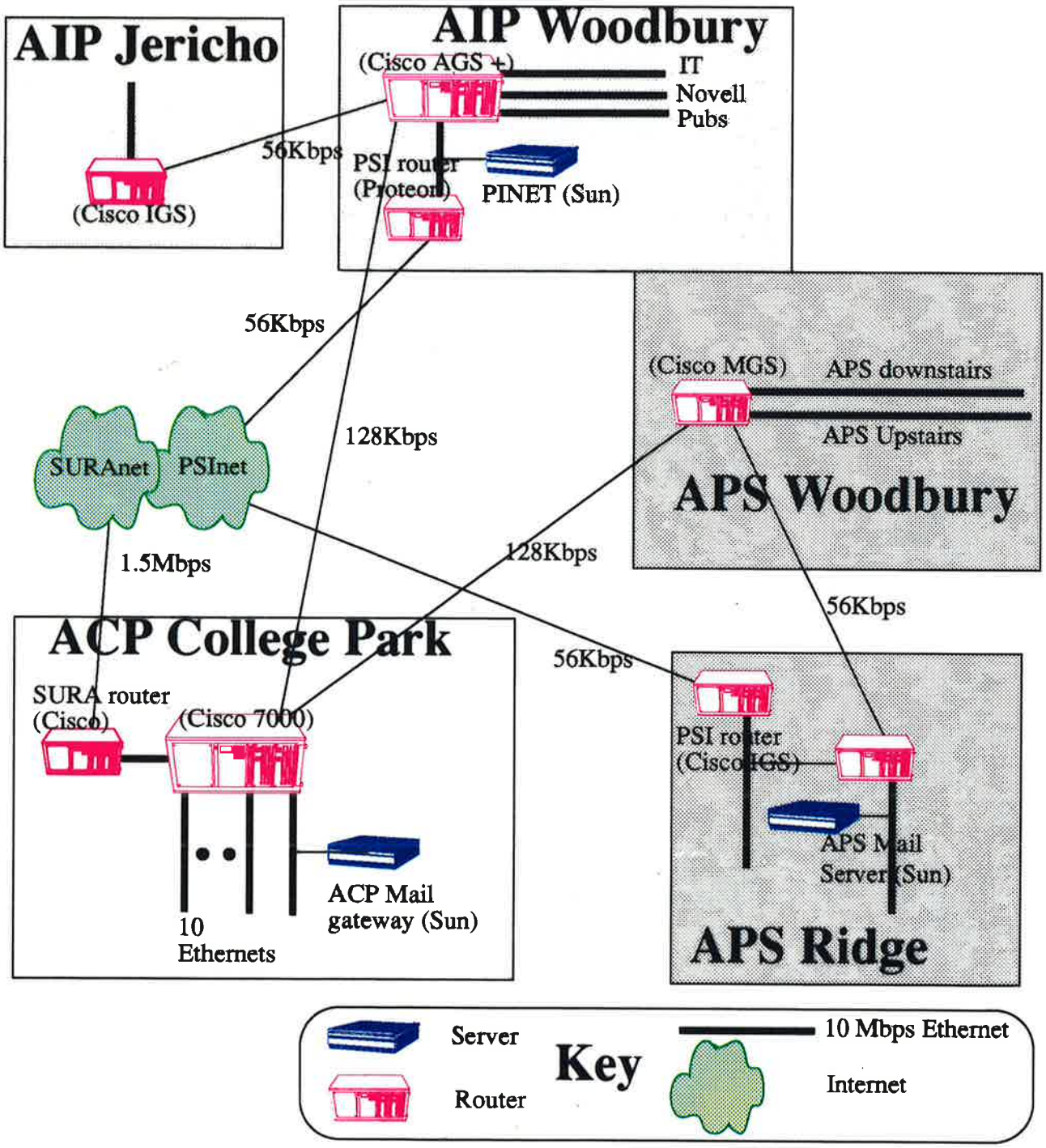
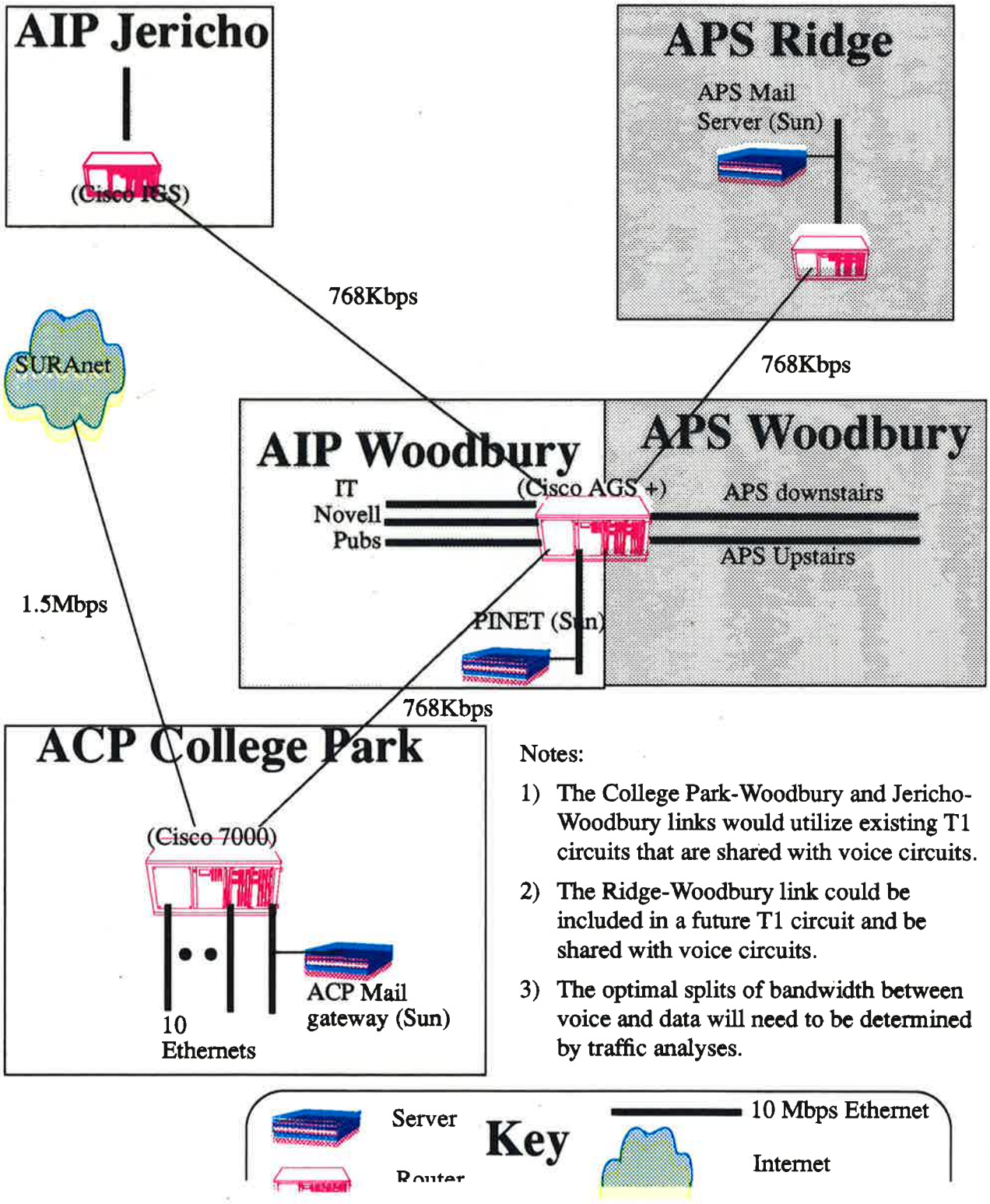


Figure 2: Recommended Wide Area Network for the ACP



Notes:

1) The College Park-Woodbury and Jericho-Woodbury links would utilize existing T1 circuits that are shared with voice circuits.
2) The Ridge-Woodbury link could be included in a future T1 circuit and be shared with voice circuits.
3) The optimal splits of bandwidth between voice and data will need to be determined by traffic analyses.

Example

Recommendations: Information Services (Databases)

- Develop a strategic plan to determine the overall database needs of the APS.
- Do not contract out database development unless no other viable option is available.
- Improve interworking and integration of the various APS databases (included in this is the need to integrate the financials). Islands of information
- Resolve the global database architecture needs before implementing the meetings database.
- Consider acquiring a more modern database system.
- Extend the database system to facilitate access to graphical information.
- Employ improved monitoring of the performance of the databases.
- Acquire higher performance hardware to run the databases.
- Explore creating a subset of the databases for online queries.
- Approximately three APS FTEs are needed to deliver acceptable quality database information in a timely fashion.

Concerns Raised

Ridge concerned about loss of direct connect to PSInet/Internet

Concerns raised about lack of redundant connections to Internet

What are the cost savings, if any?

Organizational structure for communications support at ACP

Reporting of database architect/analyst

Ridge Concerns

During the cutover from PSInet to SURAnet, the existing PSInet links shouldbe kept in place until the new links are deemed stable, this includes:

- having sufficient local management procedures in place to address the links from ridge thru Woodbury & ACP to SURAnet this includes:
  - monitoring of availability of new links
  - problem tracking & reporting procedures
- a certain comfort level (N.b. both SURA & UM have expressed willingness to help)
- compare new availability to that of the existing PSInet links.

Panel felt that this time frame is of the order of coupe of weeks to couple of months.

Then disconnect the PSInet connection to Ridge, resulting in savings:

- No PSInet membership fees to pay
- Drop payments for leased line
- Drop Cisco maintenance

Redundancy Concerns

If the availability of the new links does not exceed that of the existing links (e.g PSI links), or if emerging requirements demand higher availability, then a plan should be put into place to provide redundant access to the Internet.

- Understand real needs (e.g. length of outages sustainable, number of outages, time coverage etc.) of critical applications
- Includes identifying single points of failure (e.g. lines going through a single phone office, common power sources etc.)
- Looking at alternatives such as switched 56Kbps or ISDN/ BRI, leased lines etc. and where to locate them,
- Identifying whether the cost is worth it

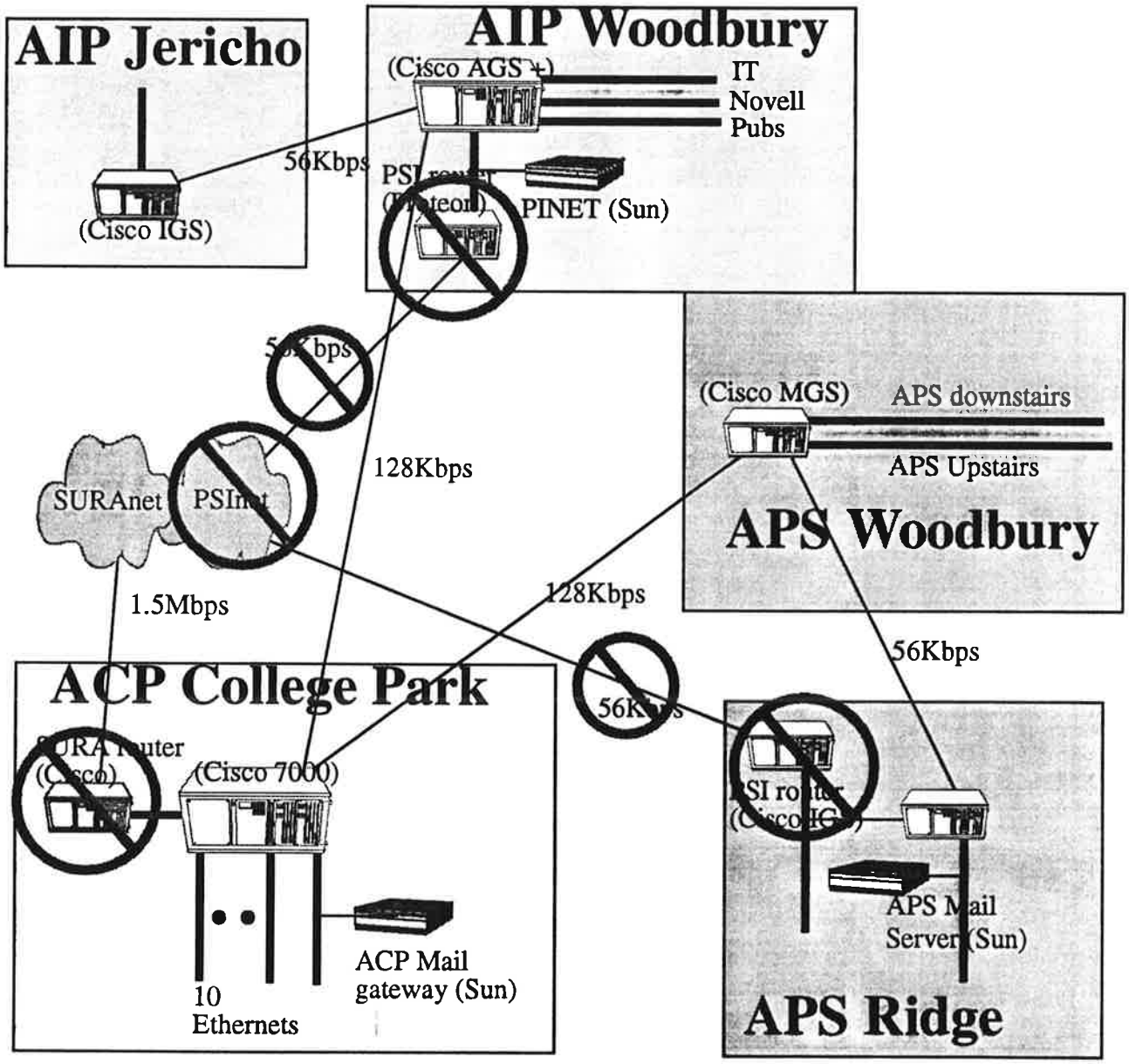
Typical network availability should be ~ 99.5% or 1.5 days of outages/year (scheduled or unscheduled)

Cost Savings with New WAN Topology

Savings:

- There is no longer a need to pay a membership fee to PSInet
- Maintenance and support for the Proteon router at Woodbury goes away.
- Maintenance and support for the Cisco IGS at Ridge goes away.
- There is no need to purchase and maintain/support an IGS Cisco router at the ACP.
- The leasing of the 56Kbps line from Woodbury to PSInet goes away.
- The leasing of the 56Kbps line from Ridge to PSInet goes away.

- Savings with new WAN Topology



On the other side of the coin:

- We take an extra (768-2*128Kbps) bandwidth from the exsiting T1 line between ACP and Woodbury.
- We also recomend an increase in the bandwidth between Woodbury and Jericho from 56Kbps, which will cost extra money if a T1 is not installed for voice. Traffic measurements/estimates may be needed to justify this extra bandwidth if it costs substantial money.

Actual savings depend on things outside the purview of the Panel, in particular how voice will be handled.

May want to review phone links & interfaces in the light of the data communications needs.

Organization of the ACP Communiations Group

The Panel is very concerned about breaking the LAN management from the router management. The routers are an intrinisc part of the LAN. There are important tradeoffs to be made between how the routers work, security on the LAN, what traffic is passed etc.

The people supporting LANs and PC network interfaces, drivers and network applications (e.g. Xwindows, TCP/IP FTP, telnet etc) need to be closely aligned. One wrongly configured PC can easily bring the network to its knees.

Since TCP/IP is native to Unix there should be a lot of communication between the router people and the Unix system admin people and there is much potential for cross-training and backing each other up. Probably many of the router admin tools are best available on Unix.

We think it would be a bad mistake to split the groups working in the network communications areas:

- potential for finger pointing
- groups become too small to have enough critical mass

- people can't support one another, be cross-trained etc.

Level 1 for immediately
2 short time w. aid of manual
3 learning

- troubles in a distributed environment are not easily isolated:
  - a window disappears on your screen or response is intolerably slow, who do you call, is it a router problem, a LAN hardware problem, a PC network configuration problem, too much traffic on the network, a slow responding server etc.?
- people in the communications group need to be aware of more than just their own particular area of speciality so they can think laterally when problem shooting.

Reporting of Database Architect

The work of the high-level database architect is an ON GOING activity.

The better the APS database systems are, the more they will want to use them for new projects. A few examples:

- As soon as APS get a meetings database going, they will want to make cross reference extractions of people who come to meetings but are not APS members.
- APS will want to track people in different categories over time.
- APS will want to setup education databases working with graduate students to see where they go.
- APS will move into graphical databases for advanced information retrieval as the networks improve.
- Foreign information on APS interests will need to go into databases.
- APS will need to setup up funding databases to track support of research and interface these with science programs and principal investigator databases from other sources.

APS will need all of this information and more in quality databases if they want to maintain a strong APS position in scientific research.

The answer to the question of should the high-level database architect report to the IS manager or the higher level(s) of APS management is a question of experience and personalities of the people involved. It cannot be answered in the abstract. The management structure chosen and the people already in place will determine the character of the people attracted to the open positions.

What can be stated is that the high-level database architect needs to work directly with whomever is setting the vision of what APS will be doing with information.