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Dear Gene and Steve:

UCSF’s strategic plan recognizes the computer network infrastructure as a vital strategic resource that supports communication and collaboration both internally and with the outside world. The Strategic Plan’s Goal 6 states that UCSF should:

- Optimally deploy information technology for administrative, academic and clinical purposes; and,
- Develop new mechanisms to fund needed investments in infrastructure, including ongoing maintenance and operating costs.

In October 2008, the Chancellor’s Executive Committee commissioned the Data and Voice Services Advisory Committee (DVSAC) to recommend a strategic approach and methodology to fund UCSF’s escalating demand for voice and data services over the next decade. The committee was asked to make recommendations that consider the needs and requirements of UCSF faculty, staff, and students, and the ability of UCSF’s schools, departments, ORUs, and other units to allocate revenues to these services.

Over the following five months, DVSAC studied background information about the current and projected needs, the use and costs of voice and data services, possible sources of revenue, and methods used by other UC campuses and peer institutions to support these services. This letter provides an update on DVSAC’s work and includes a set of recommendations for consideration by the Chancellor’s Executive Committee.

Committee Findings

In the last 10-15 years researchers, administrators, instructors and students have come to rely on the network as a strategic resource that supports effective communication, research, patient care, instruction and collaboration.
The network has arguably become one of UCSF’s most critical resources. It is at the core of the campus communications infrastructure and is now the primary means by which faculty, students, and administrators communicate and collaborate within UCSF and beyond to meet their academic, clinical and administrative responsibilities. Yet the existing network is inadequate for our current needs and will not support future growth. It is slow, unreliable at certain sites (e.g., Parnassus); and it is dangerously old and frail. Network equipment is on average fifteen plus years old; much of the network equipment is no longer supported or maintained by the vendor; maintenance costs are unnecessarily high due to the need to keep aging and outdated equipment functional.

We find ourselves in this unfortunate position because UCSF has habitually under-invested in the network. The cost of operating the network has been funded primarily through contributions from the Chancellor’s Core Funds and to a much smaller degree with revenues generated from long distance phone calls. Because of changes in voice services recharging methodology required by the federal government, beginning in July, 2008 long distance phone charges will no longer be available to support the cost of operating the network.

If we cannot create reliable and ongoing channels of revenue to support the provision of network services we will be jeopardizing our ability to maintain our leadership position in health sciences education, research and patient care.

To improve and stabilize the network, it will be necessary to replace all network equipment over the next 5 to 7 years, and then adhere to a normal equipment replacement plan. Once this is done we will have the necessary platform on which to build an “intelligent network” that will yield expanded capability and significantly enhance the current user experience. ¹

The need to invest in the network will be permanent and on-going. It is not anticipated that the need for investment will decline; rather that costs will remain stable or increase in the future as new network and user needs are identified.

Therefore, an on-going commitment from the Chancellor to provide Core Funds at the current level will be essential. In addition, and despite the inherent challenges, we recommend that the university institute a recharge to generate the necessary funds to support replacement and ongoing maintenance of the network. Once the recharge is in place, it will enable UCSF, for the first time in the history of the network, to recover costs for data services from all available funding sources, including the NIH.

Currently approximately $9 million per year of Chancellor's Core Funds are being invested in the network. We believe that the university needs to double that investment and can do so by instituting an IT Network recharge. A recharge would distribute the cost of the service with the users of the service and provide an additional $3.5 to $12.4 million in annual funding.

**Recommended Network Charging Model**

DVSAC specified guiding principles and goals for the UCSF data and voice services funding model (Attachment A). During its deliberations on voice services, DVSAC learned that UCSF had reached

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¹ The committee emphasized that email is central to the current user experience of the network and that it is an issue that needs to be defined and resolved.
an agreement with the federal government to right-size long distance phone charges by July 1, 2008; and that a voice recharge committee was being formed. It was agreed that a long term plan to fund and replace the Centrex phone system was needed, but was less urgent and strategic than the data funding plan. The primary focus of DVSAC’s work shifted to developing a new methodology for charging for data services. After exploring various charging models, the committee unanimously agreed to recommend a capitated recharge model.

A capitation model for calculating network recharges is used by almost all peer institutions, including UCLA and UCSD as well as other UCs and other academic health centers. It is scalable and adjustable over time and its relatively transparent accounting can be tied to actual full time equivalent (FTE) funding, thus making it straightforward to pass proportionate costs to all fund sources including federal contracts and grants. The capitation model is the most reasonable to implement in a timely fashion and is the fairest and most even-handed way to “share the pain.” Starting with a capitation model does not preclude other options later; assuming needs for such options evolve.

The recommended model has sufficient flexibility to allow the to-be-formed Network Recharge Committee to specify who is charged and whether they are charged a full or partial rate. A capitation model will allow the Network Recharge Committee to adjust the recharge rate according to changing needs for network services, equipment, and maintenance. The model also includes the flexibility to vary the monthly recharge amount from year to year. Using this model, the campus could start at a relatively low rate to allow schools and departments the ability to adjust to the new financial circumstances. A detailed explanation of the proposed model is provided in Attachment B.

While the Network Recharge Committee would need to specify the recharge mechanics, our initial pro forma models suggest that at the on-set of the recharge, no single control point budget would be impacted by more than ½ of a percent with the average control point being impacted by approximately ¼ of a percent.

For this investment, the university can expect to see improved service, faster speed and greater reliability at problematic locations. Assuming the adoption of the recharge, short and long term expectations for service levels are specified in Attachment C.

DVSAC developed a comprehensive set of recommendations designed to help us address the challenges we face as our need for a reliable network grows and changes. The first set of recommendations (below) speaks to the need to adopt a recharge and for members of the Chancellor’s Executive Committee to take a top-down and proactive role in driving this initiative to a successful conclusion.

The second set of recommendations (Attachment D) address the specifics required to implement a solution including coordinating the Medical Center network and the campus network in the future, continuing and perhaps increasing Chancellor’s Core Fund contribution that match the annual campus recharge amounts generated (after ramp up) and implementing the full funding model in five years in order to replace all network equipment within a reasonable time.
Recommendations

DVSAC recommends that the Chancellor’s Executive Committee:

1) Endorse the need for a recharge for network services and adopt the proposed funding model, including a capitation-based recharge.

2) Assume a visible leadership role and promote this initiative to all campus constituencies to ensure its success.

3) Commit to the objective of fully coordinating campus and Medical Center network planning and implementation within approximately five years.

Additional recommendations:

• Establish a Network Recharge Committee with representation from all schools and key departments; as well as members of DVSAC who have already gained invaluable insight and knowledge about the initiative.

• Identify “champions” in leadership roles who will participate in the necessary activities to manage the required changes that will be necessary.

• Charge the Network Recharge Committee with the responsibility to determine the type and number of FTEs charged, the amount of network expenses that will be recovered through the recharge annually, and the rate of implementation of the recharge, and the principles/standards by which the network performance will be measured.

• Develop a communication and implementation plan to ensure campus constituencies understand the purpose and rationale behind the data recharge initiative; and that all activities necessary to implement the recharge are identified and managed to a successful conclusion.

• Initiate talks between the campus and Medical Center with the objective of fully coordinating campus and Medical Center network planning and implementation within approximately five years.

Conclusion

The computer network infrastructure is a vital strategic resource that supports communication and collaboration. UCSF has habitually underinvested in this resource and we now find ourselves at risk. In keeping with the Strategic Plan’s Goal 6 that urges optimal deployment of information technology and the development of new funding mechanisms to ensure that on-going investment in infrastructure (including ongoing maintenance and operating costs), we recommend the current investment of approximately $9 million a year be doubled over the next decade in order to ensure the network will continue to meet the growing and changing needs of researchers, administrators, instructors and students as they fulfill UCSF’s mission relative to research, patient care and instruction.
Going forward, it is recommended that a recharge for data services, similar to that found at other comparative institutions, be instituted to fund improvement and on-going maintenance of the network; that the Chancellor’s current core network funding be maintained and going forward match the full recharge amounts be generated; that UCSF leadership assume a visible role in managing the change associated with this initiative; that efforts begin as soon as is feasible to coordinate campus and Medical Center network planning and implementation; and, that the university commit to a reasonable (e.g., five year) network equipment replacement plan.

Very truly yours,

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Chairman, Department of Radiology  
School of Medicine  
DVSAC Co-Chair  

Robert M. Duca  
Associate Dean-Administration and Finance  
School of Pharmacy  
DVSAC Co-Chair  

cc: Randy Lopez  
Associate Vice Chancellor-Administration; Co-CIO  

Jonathan Showstack  
Assistant Vice Chancellor and Co-CIO  

Eric Vermillion  
Associate Vice Chancellor-Finance
Attachment A

Principles and Goals for UCSF Data and Voice Services Funding Models

• Provide a strategic approach and methodology to fund UCSF’s escalating demand for voice and data services that takes into account the University’s strategic goals and its capacity requirements over the next decade.

  o Establish a Service model and a Funding model to address services and related funding to achieve services. These models should:

    ▪ Consider the needs and requirements of UCSF faculty, staff, and students.

    ▪ Establish a minimum level for each service, including performance expectations where appropriate. The minimum level may be different for on-campus vs. off-campus locations. Service levels above the minimum may also be established.

    ▪ Address both current operating needs as well as longer term capital improvement needs.

    ▪ Be scalable to allow the services and cost structure to grow as UCSF grows.

    ▪ Consider technological advances and improvements.

    ▪ Recognize that the Service model and the Funding model are interrelated. As a consequence, if a Funding model is not achievable, the Service model will need to be scaled down to meet an achievable Funding model.

    ▪ Be reviewed at least annually and updated as necessary.

  o Create a viable “intelligent network” that meets performance expectations and ensures that campus services are competitive with outside services.

    ▪ Improve scalability, reliability, capacity, security and services of the network.

  o Support maintenance and improvement of data and voice services over the next decade including projected purchase, maintenance, and replacement costs for network equipment.
- Utilize funded depreciation
- Build up a reserve account(s)
  - Take advantage of opportunities to partner with the Medical Center to create economies of scale and ensure that faculty members have a seamless user experience whether on campus or at the Medical Center.

- Consider the needs and requirements of UCSF faculty, staff, and students, and the ability of UCSF’s schools, departments, ORUs, and other units to allocate revenue for these services.
  - Appropriate representation from all constituencies when establishing or reviewing Service and Funding models.
  - The models should hold the entire campus to the same standards and requirements but also take into account units that are disadvantaged. It will be prudent to create a fund that provides central matching dollars to help units who are disadvantaged due to their geographic location, e.g., Parnassus.
  - We need to be especially mindful of researchers who need time to build direct charges into their grant applications.

- Funding model should be simple, be transparent, be perceived as fair, and encourage appropriate use.
  - Transparency and clarity about costs, charges and fund allocation is essential to successfully implementing the funding model among campus constituencies.
  - The need for or degree of central subsidization of the network services (i.e., the Chancellor’s Core Funds) should be explicitly defined and managed in the charging methodology.
  - Segregate voice and data charges as required by the federal government and “true-up” long distance charges.
  - Model should take into account the impact on department’s workflow and responsibilities and not result in an unfair or additional burden.

- There should be explicit measures for success and an on-going assessment of progress over time as the funding model is implemented including oversight of expenditures and revenue collected using the recharge model.
The model should be well defined in terms of the cost and timing; and we should stick with our plan. The campus needs to know what to expect in terms of how much and when.

A recharge committee should review and approve the model and monitor the implementation plan.

Ensure compliance with A-21 and federal guidelines regarding recharging contracts and grants.
Attachment B

Proposed Data Funding Model

The recommended data funding model has four components which are described below.

- **The Population Pool**: the model allows the Recharge Committee to specify who is in the population pool and gives them the ability to exclude or discount certain employee types due to no or low network usage using a data use factor. Once the pool is known, total data use per actual full time equivalent (FTE) can be calculated based on pro-rated percent of time.

- **The Data Cost Share**: the model allows the Recharge Committee to specify what the projected investment in the network for the upcoming year will be; and then what portion of that investment will be recovered through recharge. That number will be divided by the total data use by FTE. This figure represents the Data Cost Share, which is the proportional charge for providing connectivity to a single full-time equivalent employee. That figure divided by 12 is the monthly data share cost per FTE.

- **Distribution of Recharge**: the charge that represents the monthly data share cost per FTE would be applied to all FTE on the payroll record. The amount applied is adjusted by the data use factor, where applicable, and then distributed proportionally to fund sources based on specified payroll distribution for each employee.

- **The Recharge Ramp**: administrators can implement an initial charge and ramp the charge up over time - as approved and directed by the Data Recharge Committee. The model provides the flexibility to slow down or accelerate equipment replacement and building of an "intelligent network" as campus requirements, priorities and available funding are determined.

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2 For example, the Medical Center FTEs could be excluded from the population or charged a steeply reduced amount in lieu of the fact that the Medical Center currently runs its own network.

3 It is recommended that students not be included in the population pool unless they are paid employees or residents in student housing.
Attachment C

Expectations of Service Levels

By replacing all current network equipment we expect to build a network that scores significantly better in key domains than our current network; and is scalable, reliable and secure; provides increased capacity; and will create a platform on which a multitude of services that are required to support current and future network needs can be more effectively developed and managed.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
<th>Current Grade</th>
<th>Comment on Current Grade</th>
<th>Revised Grade after Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalability</td>
<td>The degree to which the network can accommodate growth in demand without full scale replacement</td>
<td>D</td>
<td>NGMAN will address this at the metro-level of the network.</td>
<td>B</td>
</tr>
<tr>
<td>Reliability</td>
<td>The degree to which the network is up and running without downtime (e.g. “five nines” means up 99.999% of the time).</td>
<td>D</td>
<td>While we have generally been lucky, our equipment does fail due to age resulting in random outages.</td>
<td>B</td>
</tr>
<tr>
<td>Security</td>
<td>The degree to which the network is able to detect and manage security threats from hackers.</td>
<td>C</td>
<td>Equipment added in past two years to help manage Intrusion Prevention and Detection.</td>
<td>B</td>
</tr>
<tr>
<td>Capacity</td>
<td>The maximum amount of data being able to be transmitted on the network (e.g. 100Mbps for a LAN).</td>
<td>D</td>
<td>LAN - varies widely by location. Backbone - currently limited to 155Mbps.</td>
<td>B</td>
</tr>
<tr>
<td>Flexibility</td>
<td>The ability of the network to intelligently manage services like videoconferencing, HDTV, etc.:</td>
<td>F</td>
<td>Current UCSF network lacks QoS or other “smart” features; minimal wireless deployment</td>
<td>B</td>
</tr>
<tr>
<td>Ubiquity</td>
<td>The degree to which a given level of service is available to anyone within the UCSF network.</td>
<td>D</td>
<td>High variability in above domain grades by location.</td>
<td>C</td>
</tr>
</tbody>
</table>

Once this platform is established the university will be in a position to build an “intelligent network” with the following attributes and benefits:

**Scalability**
- Most upgrades to the network can be done on the module or card level without wholesale replacement of equipment, making the network easily expandable
- Provides a significantly larger address space that allows greater port density and lower life-time costs of devices

**Reliability**
- Is self-healing – designed to automatically detect and fix performance problems
- Automatic re-routing ensures continued data movement even when problems occur
- Redundant processing capability ensures that isolated problems areas don’t affect an entire building or spread to other locations
Security
• Security devices proactively prevent malicious activity on the network resulting in an enhanced level of network security
• Wireless component of the network can detect and disable rogue access points
• Authentication for wired and wireless LANs capability gives only authenticated users access to the network

Capacity
• Expanded bandwidth and increased speed that results in faster downloads
• Larger “pipes” that allow sharing of enormous files, e.g., radiologic images, research files, video streams, etc.

Services
• Offers sophisticated routing that can detect and prioritize network traffic based upon rules or protocols which “guarantees” a level of performance for time sensitive applications such as voice and video
• Supports protocols that better enable specialized network applications (e.g. video conferencing) to reliably function
• Reduces traffic and conserves bandwidth by simultaneously delivering a single stream of information
Attachment D

Additional Recommendations

• We are all in this together. All schools, departments, administrative units, and eventually the Medical Center, will need to invest in the strengthening and maintenance of the network. Going forward, it will not be cost-effective to build separate solutions.

• The Chancellor will need to continue to invest in the network at the current rate; and perhaps at an increased rate in the near-term to make up for past under-investment in this important strategic resource.

• The recharge model should be fully ramped in five years in order that the aging network is fully replaced in a 5-10 year timeframe.

• Once all equipment is replaced, the campus should adopt and fully fund a five year equipment replacement plan for all network equipment.

• The Medical Center network and campus network should be coordinated so that hospital network planning and implementation is fully incorporated with campus within approximately five years. If this goal is to be realized, planning should begin soon.

• Units and departments who are unable to pay the recharge for data services should be supported through a central matching dollars fund that is funded within the model (not outside).

• Once the capitated funding model is in place, it may be appropriate to consider blending charging methods (e.g., per outlet/jack, IP address, bandwidth, capitated rate, premium services,) as appropriate and as we are able, in order to provide the flexibility to change over time, meet new requirements and take advantage of emerging technologies.

• The manner in which space in allocated should take into account intensive computer needs and network levels of service. Workspace should be assigned with this in mind. To this end, there should be a point of contact where network questions can be addressed.

• Future efforts to expand or remodel space should include estimating and budgeting for required improvements to support network usage (e.g., cabling, closet additions or renovation to house network equipment).

• Cabling and closet infrastructure costs should be paid for outside the funding model in order to reduce the recharge amount and give people more flexibility relative to managing these costs.

• The right skills will need to be in place within Enterprise Network Services (ENS) in order to support the required growth and improvements to the network over the next five years and beyond.