Department of Astronomy
Computing Status

Prepared February, 2003
by Ken Sallot

Section I – Current Computing Status

Section II – Goals and Areas of Focus

Section III – Department Computing Needs

Section IV – Appendices and Documentation

Department of Astronomy Computing Status, Spring 2003

Introduction

In August, 2002 I presented a report on the computing status of Astronomy to the faculty and staff in the department. The report detailed the state of the departmental computing resources, as well as provided a proposed plan to correct many of the shortcomings. This report is an update on the current status, and the progress we have made since August 2002. It will also discuss issues that were overlooked in my previous report.

This report consists of four sections:

The first section will review the current state of the departmental computing, comparing it with the state back in August. It covers desktop machines, server machines, software licenses, and networking infrastructure.

The second section will discuss goals and areas of focus. It covers documentation and training, as well as the establishment of a recurring IT budget.

The third section consists of a summary of both the critical computing needs that must be addressed during the next eighteen months, as well as items that we would like resolved in an ideal world.

The final section contains network diagrams and documentation, survey results, and other items.

Section I: Current Computing Resources and Status

The Department of Astronomy has approximately 210 devices connected to the Astronomy network. These devices are located within Bryant Hall, Rosemary Hill Observatory, and the UF Radio Observatory. Currently, the departmental IT staff are responsible for managing approximately 170 of these devices. The remaining devices are managed by other groups within the department.

Desktop PC's (Intel)

Linux

The majority of the devices managed by the IT staff are Intel compatible x86 based “PC” computers. The majority of these PC's run the RedHat 8.0 Linux operating system, but there are approximately 40 Microsoft Windows machines as well. Desktop PC's in the department are used for a wide variety of purposes, ranging from data analysis and programming to email and web-browsing.

The Linux workstations are primarily used for data analysis and programming. They are also used for email and general purpose client machines by their primary users.

Between December 18, 2002 and January 15th 2003, all of the Linux workstations managed by the IT staff were converted to RedHat Linux version 8.0 by using the RedHat Kickstart tool. Prior to the upgrade, the departmental IT staff had to manage Linux workstations running any of eight different versions of the Linux operating system.

Starting the last week of January, 2003, I have been migrating our RedHat 8.0 workstations to an RDIST based synchronization system. Each night RDIST synchronizes each workstation with a master image, correcting any consistency problems, and installing any security patches or software updates that we select. The migration of our Linux workstations to a nightly RDIST synchronization system will allow us to maintain a homogenous and identical network of Linux workstations as well as to provide updates in a controlled and timely fashion.

RedHat Linux 8.0 is the most recent release of RedHat Linux, which means that it should be supported longer than any other version of RedHat Linux currently available. However, on December 20th, 2002, RedHat announced[1] that they will only provide support in the way of security updates for their “standard desktop distribution” up to 12 months after initial release. RedHat did announce they will support their Advanced Workstation product with security patches and updates for up to five years after release, but they have yet to release their first version of the Advanced Workstation product.

The impact of the new support policy is this: if the Department of Astronomy wishes to continue to receive security updates from RedHat, we will either have to upgrade our workstation operating systems annually, or purchase license(s) for their Advanced Workstation product, or switch to a competing

1 RedHat Errata Support Policy, http://www.redhat.com/apps/support/errata/

Linux distribution. Because the RedHat advanced Workstation has yet to be released, it is premature to make a suggestion at this time. However, the RDIST synchronization system may allow us an easy migration path to upgrade each workstation automatically.

Windows

The Microsoft Windows workstations used in the department are used in the teaching lab, by the office staff, the instrumentation lab, and some faculty offices. There are also MS-Windows PC's located in the Radio and Rosemary Hill observatories. For the most part, the MS-Windows PC's are used for word processing, web-browsing, and electronic mail. The biggest threat to the MS-Windows PC's comes in the form of viruses attached in email.

We currently do not have an automated method of updating the anti-virus definition files for our MS-Windows PC's. As we increase our support of MS-Windows, we should investigate automated methods of providing anti-virus upgrades, as well as investigate providing anti-virus filtering on our e-mail server.

Summary of Intel PC's

The biggest problem that Astronomy faces with the Intel based PC's is that the majority of them have exceeded their service life. Ideally, the maximum life cycle of a PC for a “power user” is three years, while a regular “desktop” user is four years. Several of our PC's are currently over five years old with some older than six years old. During the next fiscal year almost 30 PC's will age beyond five years.

Supporting these older PC's is difficult and time consuming. In many cases they are rapidly approaching their mean time before failure (MTBF). It is only a matter of time before the hardware on these older machines begins to fail because of age, and some of these machines are already experiencing power supply, video card, and hard disk failures.

Previously, the College used to provide us with an annual computer disbursement. The primary purpose of the disbursement was to replace approximately 25% of the faculty desktops each year, allowing departments to maintain a four year life-cycle for their faculty machines. Individual departments were then left on their own to provide adequate machines for their students and staff.

We have not received a computer disbursement from the College of Liberal Arts and Sciences Deans Office during fiscal years 2001-2002 or 2002-2003, and it is unlikely we will see a disbursement during the remainder of this fiscal year. As a result, the department should recognize that we are responsible for replacing all of our desktop PC's. We need to establish a recurring annual budget to rotate our desktop PC's within a four to five year life cycle. When projecting this budget, we should expect to replace up to 25 PC's each year.

Recommendation: We should expect to replace between 20-25 desktop PC's every fiscal year. This should be an annual budget item.

Desktop PC's (Sun Workstations)

The departmental IT staff currently manage seven Sun Workstations running the Solaris 8.0 operating system. These machines are named *fig, numfar, monoceros, tweety, pbj, tapas, and yoda*.

The hardware on these machines is adequate for the tasks they are required to perform, however there is a large inconsistency in the software configuration on these machines.

The first three machines, *fig, numfar, and monoceros* were cracked by an outside intruder in May, 2002. Because they were cracked before I joined the department, I am not sure how these machines functioned prior to the attack. The deans office provided emergency support in getting these workstations reformatted and reinstalled, but they have been "buggy" ever since.

For example, the print spooler on *numfar* is often incapable of printing large jobs, some applications periodically crash or refuse to run, and there are multiple copies and multiple versions of the same applications scattered throughout their filesystems.

In contrast, the newer machines, *tapas, pbj, tweety, and yoda* appear to function correctly.

Without a doubt, the aid the deans office provided made it possible to get the cracked machines up and running in a timely fashion. However, it is likely that the deans office standard configuration is incompatible with our software requirements. To address and correct the problems with *fig, numfar, and monoceros*, we should devote some time to upgrade all of our applications on Solaris, and reformat and reinstall these machines with the same configuration we have been using on the newer machines. Once the workstations have been re-installed, we could maintain homogeny between all of the Sun workstations using the same RDIST tool that we are currently deploying to maintain our Linux workstations.

Because the problems with the Solaris workstations is more of an inconvenience rather than a complete inability to get work done, I would like to address the problems with them during the Summer 2003 period. By performing the software upgrades while the primary users are on vacation, we will minimize the negative impact and inconvenience to them while their machines are reconfigured and reinstalled.

Planning for the Solaris workstation upgrades can progress during the remainder of the Spring semester. The planning will include documenting the software requirements, upgrading and testing the applications, and cleaning up and identifying the older applications that are no longer in use.

Recommendation: Reinstall the operating system on *fig, numfar,* and *monoceros* during the Summer 2003 break. Upgrade all of the current applications for Solaris. Clean out the duplicate applications. Develop a nightly RDIST synchronization system.

Other Workstations (non-Intel/Sun)

There are three workstations which run IBM AIX version 3.2. These are located in the 1st floor lab. These machines were purchased over ten years ago, and run a version of AIX that IBM has stopped supporting in the past five years.

These IBM RS-6000's run custom developed software for instrumentation management and data collection. Unfortunately, they are not secure and it is not possible to get security patches from the vendor for them. Because of their age, it is impractical to purchase replacement parts from IBM in the event that a component on one of these machines fail.

Prior to December we had a fourth non-Intel/Sun workstation running DEC OSF-1 Unix. It was decommissioned and replaced with an Intel based PC running RedHat Linux 8.0, saving the department a recurring annual cost for the Compaq/DEC license.

Recommendations: Either hire an outside programmer to port the applications to Linux or Solaris and replace the RS-6000's with more modern equipment, or disconnect them from the network so they will not pose a security risk for the department.

Printers

The department has one color printer and several black and white laser printers in various locations within SSRB. The public printers are currently located in SSRB-211, SSRB-221, SSRB-309, and SSRB-405. In September, 2002, we relocated the printers to locations that made them the most strategically available to the users on each floor.

Three of the printers, *office, fourthfloor,* and *thirdfloor*, are now eight years old. We should plan to replace two of them within the next fiscal year, and replace the third one the following fiscal year. Replacement printers will cost approximately $1500 a piece.

The color printer is six years old. Because of the technology behind our old Phaser 750 the consumables are very expensive. So far during FY 2002-2003 we have spent over $1200 in consumables for the color printer. The technology behind color laser printing is now more advanced and less expensive. We may wish to investigate the costs of acquiring a new color printer which would be more cost effective to operate either during FY 2003-2004, or FY 2004-2005.

Recommendation: Replace two black and white laser printers FY 2003-2004. Replace a third black and white laser printer FY 2004-2005. Investigate alternative options for the color laser printer.

Servers

The departmental IT staff currently manage ten Linux server chassis, one Solaris server chassis, one Windows server, and two FreeBSD server chassis.

The servers provide centralized file storage, email, web-access, and applications deployment. There is also a processing farm used for running jobs.

Woodstock

Woodstock is a Sun E450 that we inherited from the College of Health Professions. We purchased new disk and memory for it, and put it into production during the winter 2002-2003 break. We were able to save almost $5,000 over the cost of a new chassis with adequate disk storage by recovering the E450.

Woodstock is our primary NFS (file) server, our Windows Networking (SAMBA) server, our NIS domain (authentication) master server, our license manager server, our log-host, and in March it will also become our print server. It runs Solaris 8. With the exception of three users, all of our user home directories are stored on a redundant disk array (RAID level 5) housed on woodstock. Additionally, all of our applications are housed on *woodstock*.

Woodstock has nine 73gb LVD SCSI drives in its disk array, and three 4gb drives used for swap space and boot drives. It has four processors, three power supplies, and 1.2GB of memory.

Terra

Terra had been our previous home directory storage server. It currently functions as our print server, our backup NIS server, and our tape backup server. During Spring Break *terra* will be decommissioned. The print services will be moved to *woodstock* and the tape drive will be put on *tapas*. Because *terra* is nothing more than a Dell Optiplex workstation chassis that had been pressed into service as a server, once it has been decommissioned, we can redeploy the chassis as a workstation elsewhere to replace an older machine.

Polaris

Polaris is our current login server, DHCP server, DNS server, FTP server, and NIS slave server. *Polaris* runs RedHat Linux. It also had previously been our NIS master server, web-server, and license manager server. *Polaris* is a Gateway E3400 desktop machine. We should replace *Polaris* with a Dell PowerEdge 1650 server chassis, consisting of adequate memory, redundant power supplies, and redundant hot-swap disk capability. The cost would be approximately $2000.

Because *polaris* is a desktop chassis, once *polaris* has been replaced, we can take the current chassis and redeploy it elsewhere to replace an older desktop machine.

Davinci

Davinci is a home built dual 450-MHz Xeon processor machine running FreeBSD that we acquired from the College of Design, Construction, and Planning. It is our current mail server. *Davinci* runs spam-assassin to filter out unwanted commercial email, the University of Washington IMAP and POP (mail) daemons, and postfix for local mail delivery. It was put into production in January 2003.

In the future, we would like to have our mail server filter viruses, however *davinci* does not have enough memory or processing capability to effectively work as a virus filtering system in conjunction with spam filtering and mail delivery.

Davinci does not have redundant power supplies, and is not a true server class chassis. We should replace *davinci* with a Dell PowerEdge 1650 server chassis that would be capable of providing anti-viral filtering as well as supporting our current mail volume. The cost for the server chassis replacement would be comparable to the cost for replacing *polaris*.

Picasso

Picasso is a home built machine running FreeBSD. It serves as our web-server and mail storage server, as well as runs the database for the Flamingos Project and provides streaming audio for the Radio Jove project. *Picasso* is owned by the Flamingos project, and is the first server we absorbed from them. It was put in production in November 2002.

We should move the mail storage from *picasso* and put it on *woodstock*. We should also move our web-services to *polaris* when we replace the *polaris* chassis with a new machine. *Picasso* can continue to run as the Flamingos project database server as well as the UF Radio Jove streaming audio server, and should be relocated into the same rack that the other Flamingos Project servers reside.

Helios

Helios is a multi-processor Alpha box running RedHat Linux 6.1. It is primarily used for data processing.

We need to upgrade *helios* to either a more modern flavor of Linux, or to a flavor of the BSD operating system, in order to get recent security patches for it.

Kathmandu

Kathmandu is a file server owned by the Flamingos group. It is a home built multi-processor box with 400gb of disk. We took over management responsibility of *kathmandu* in December 2002 and had to immediately replace the non-redundant RAID0 array with a redundant RAID5 array due to imminent disk failure.

The Virgo Cluster

The Virgo Cluster consists of six machines; *virgo* and *virgo[1-5]*. It is primarily used as a processing farm by the Flamingos Project. We took over management responsibility of the cluster in December 2002. We initially had to spend several days labeling, organizing, cataloging, and re-arranging the physical layout and configuration of the cluster.

During the Fall semester, 2002, we retired the following servers: *taurus, micron,* and *urania*.

Recommendations: Replace the *polaris* and *davinci* servers with Dell PowerEdge servers. Move the mail spool from *picasso* to *woodstock*. Move

the web-services from *picasso* to the new *polaris* chassis. Implement virus filtering in addition to spam filtering on the new *davinci* chassis.

One additional note regarding server chassis. During the past several months we have consolidated the user home space to our E450, upgraded applications delivered from the server chassis, and corrected many of the load and configuration problems with the previous server implementation.

However, the number of server chassis we currently manage has more than doubled since August, 2002. The growth in server chassis was primarily caused by the absorption of the the Flamingos Project server farm. We were asked to take over responsibility for their servers when their system administrator left. This is good for the department because it allows us to maintain departmental standards on their server chassis, however, we need to remember that the added support burden reduces our abilities to take on additional tasks and projects.

Tape Backup and Tape Drives

The department purchased a Hewlett-Packard LTO/Ultrium tape drive during FY 2000-2001. The LTO drive is capable of storing up to 200 gigabytes of data on a single tape using data compression.

Although this drive is very good and capable, backups were not being performed on a regularly scheduled basis in the department prior to August 2002. In the second week of August I deployed a set of tape backup scripts which have allowed us to backup user home space and application data on a regular, consistent, basis.

Our current backup policy has us making a full backup of user home space and application data every Wednesday, and performing an incremental backup of files that have changed each night. Each week requires one tape, and we have 24 tapes providing us a 24-week backup horizon. We take the previous weeks backup to an off-site location for storage. After a week has passed, the tape is brought back on campus.

Although our backup procedure accounts for the home space of every user, we do not currently have the capability to backup the data directories that are stored on each workstations local disk. These data directories are the work areas that students, post-docs, and faculty often use to store their project work.

The amount of data that is generated and manipulated by the users in the department is well in excess of two terabytes (2,000 gigabytes), and closer to three terrabytes. The Flamingos Project consumes over a terabyte of data by themselves and has asked that we spec out a new server chassis for them with an additional terrabyte of storage capacity.

Considering that our total backup capabilities are not even double of our current storage usage, it is not possible to make backups of this data with our current tape hardware.

Although it would be possible for us to purchase a multi-tape changer with

adequate tape capacity to meet our backup needs thus providing complete system backups for all users in the department, it would cost us between $15,000 and $20,000 in hardware and media to do so. Instead, we recommend that the departmental IT staff will continue to provide system backups for user home and application data directories, and that users concerned about their other data should purchase adequate backup media and use any of a number of tape drives that we have scattered throughout the department. We have 4mm, 8mm, and DLT drives located in rooms 221, 309, and 310.

For people that have data requirements in excess of the capabilities of the departmental tape drives, they should investigate purchasing storage on the NERDC TSM Backup system. NERDC charges $0.01 per gigabyte per month for data storage, backup, and restoration. Additionally, NERDC has provisions for off-campus storage of the backups. More information on the NERDC TSM system can be found at http://adsm.nerdc.ufl.edu

Another option which could provide low-cost and relatively high capacity backup would be to purchase a DVD recorder and let students purchase their own media to make DVD's. The current media costs are approximately $2.00 per 4GB of storage with DVD.

Recommendations: Purchase a departmental DVD burner and make it available to the students. Provide information on the NERDC TSM service and on the location and usage of our departmental tape drives.

System Logging and Security Policies

The University of Florida Security Policy[2] requires that each unit maintain an audit trail for each device connected to the campus network. That is, when it is technically possible to do so. Starting February 1, 2003, the departmental IT staff have implemented a loghost which collects system logs from our workstations. The logs collected include user authentication (login/logout) times, mail delivery errors, and other appropriate data.

Once a week a summary of the logs are collected and archived. A log analyzer scans the logs for unusual activity and notifies the system administrators when there is a potential problem. Annually we will take the previous years logs and burn them to read-only media, either DVD or CDROM.

The University Security Policy requires that we develop and publish a comprehensive set of policies and procedures. These policies include providing for the physical security of computer equipment, auditing and accountability of user accounts, host and network security, and providing training and security awareness.

We currently require that all users accept and abide by the provisions in the University of Florida Acceptable Use Policy.[3] As of November, 2002, any new departmental account must sign a written agreement that the individual understands and accepts the UF Acceptable Use Policy. A copy of the

2 UF Security Policy, http://www.it.ufl.edu/policies/security
3 UF Acceptable Use Policy, http://www.it.ufl.edu/policies/aupolicy.html

Department of Astronomy Account Agreement is included in Section 4.

Recommendations: In order to comply with the UF Security Policy we must establish a security policy which includes the following components:

1. Physical Security considerations for computing resources
2. Authentication and Authorization accounting
3. Host and Network security
4. Training and Security Awareness
5. Business Resumption plan

Network Resources

The Department of Astronomy has a network infrastructure spanning the five floors of the Bryant Space Science Research Building, and two remote locations fed through a microwave transmitter located on top of Ben Hill Griffin Stadium.

SSRB Network

The Astronomy network within the Bryant Space Science Research Building consists of twisted pair and fiber-optic network cabling and equipment. A diagram of the SSRB Network is included in Section 4 of this document.

Twisted Pair

With the exception of the instrumentation lab on the 4th floor, each room within the department has at least two category 5 twisted-pair network drops. Depending on the installation date, the network connection either feeds to the 2nd floor telecommunications closet in room 209, or to the telecommunications closet on the same floor that the room is on.

There is a network backbone that runs between the 4th floor and basement telecommunications closets. This backbone consists of 100MB category five cable and feeds the network electronics that have been deployed in the various telecommunications closets. Additional workgroup switches have been deployed in individual rooms to make extra drops available as needed.

All new network drops which have been installed since June 2002 return to the communications closet on the same floor. This is consistent with UF Telecommunications Networking standards. During fiscal year 2002-2003, to date, we have installed over 60 new network drops on the 3rd, 2nd, and basement floors of the building.

Long term, we should investigate upgrading the departmental network infrastructure to include a fiber-optic backbone between the telecommunications closet in the department, and moving the network electronics to the telecommunications closets of the floors they serve.

Fiber-Optic

In December 2002, a fiber-optic network path was installed between the 4th floor telecommunications closet and the Instrumentation Lab in rooms 417 and 421. The fiber-optic pathway helps to provide electrical isolation between the departmental network and the lab.

Additionally, there is abandoned fiber-optic cable in the 4th floor telecommunications closet which terminates in the NERDC machine room. This fiber-optic cable was used by Network-Services and the Office of Academic Technologies (nee Office of Instructional Resources) to provide support for the classroom that used to be on the 4th floor.

Network-Services has agreed to let us use the abandoned fiber-optic cable to replace our current network connection to the campus network. However, in order to implement the new network point of presence, we will need to purchase new network electronics which include fiber-optic interfaces.

Coaxial Cable

On December 26, 2002, I generated a complete network map of the departmental network with the assistance of Network-Services staff. During the generation of the network documentation, we went ahead and disabled the remaining coaxial network which had previously fed the 1st floor labs. The network feeds to the first floor had been previously replaced with Category-5 twisted pair in the first week of December.

Rosemary Hill and The Radio Observatory

The Rosemary Hill Observatory is located approximately 35 miles from the University of Florida Campus just outside of the town of Bronson. The Radio Observatory is located an additional 20 miles from Rosemary Hill, outside of Oldtown. Both locations have a network connection to the UF campus in order to provide monitoring capability for the devices located there. A map of the network link is included in Section 4 of this document.

The observatories are connected to the UF Campus network through a line of sight microwave transmitter located on top of Ben Hill Griffin Stadium. The first link connects Rosemary Hill to UF, then a second repeater connects the network to a fire-tower outside of Chiefland. The final link connects the Radio Observatory through the fire tower connection point.

Prior to the Fall Semester, 2002, the network connection between the observatories and the UF campus was on the same VLAN as the Astronomy network. The impact was that all broadcast traffic internal to the department would consume available bandwidth on the wireless link. In September we reconfigured the wireless network in conjunction with Network-Services staff, separating the wireless network from the main departmental network. This has improved the network connectivity between the observatories and the rest of campus.

In January, 2003, there was a week-long disruption in service to the observatories. This was caused by an accidental re-alignment of the transmitter tower located on top of Ben Hill Griffin Stadium by members of the construction crew that are working on the stadium expansion project. The disruption was not announced, not intended, and required outside contractors to re-align the microwave antennas. It is my understanding that there will be no further unannounced disruptions in service.

Network Protocols and Network Connection

The Astronomy network is fed the IP protocol from the Network-Services connection in our 2nd floor telecommunications closet, room 209. IP is the "native tongue" of the internet, and all of the networked devices within the department use IP.

Each machine in the department is assigned a unique IP address. IP addresses take the form of *w.x.y.z* with each section being an 8-bit number. Network-Services provides both "public" and "private" IP addresses to all units on campus that need the IP protocol.

Public IP Addresses

A public IP address is an IP address that is routed on the internet. This means that any machine with a public IP address can be seen by any other device connected to the internet. Astronomy currently has 253 public IP addresses allocated to it by Network-Services.

Additional public IP addresses are difficult to come by. We have an excess supply of public IP addresses, and should consider returning half of our IP addresses to Network-Services within the next 18 months.

Private IP Addresses

A private IP address is not routed on the internet, which means that machines with private IP addresses are not remotely accessible on the internet. However a device with a private IP address may be able to access the internet through either Network Address Translation or a proxy-server. The department currently has 253 private IP addresses allocated to it, and if we need more, they are easy to come by.

Static IP Addressing -Vs- DHCP

There are two common ways to assign IP addresses to hosts on the internet; static addressing and the the Dynamic Host Configuration Protocol (DHCP).

Prior to August, the department used Static Addressing to issue IP addresses. The disadvantages to this approach include that any changes in network topology require modification of each host on the network, a separate table must be maintained for each host and it's IP address, and a misconfiguration of one device could disrupt service to another device. DHCP overcomes these problems, and we have been migrating our workstations to this addressing scheme.

In August we migrated all of the PC's in the departmental office to DHCP. During the migration, we discovered that there were several "rogue" DHCP servers on the departmental network. This problem was corrected, and we were able to successfully migrate the office staff PC's to DHCP. All of the Linux workstations were migrated to DHCP when they were upgraded to RedHat Linux 8.0.

One final comment about DHCP. We currently provide ten unauthenticated IP addresses via DHCP. This means that at any time any person can plug their computer into the departmental network and receive an IP address without requiring our assistance.

The advantage of this model is that visitors to the department may receive network connectivity just by plugging into one of our network jacks, however this may be in violation of the previously cited UF Security Policy; there is a section in the policy which states that we must be able to identify any host or resource on our network. Because can now identify the physical location of any computer on the network, that may be sufficient to meet the requirements of the security policy. If the ability to identify the physical location of any machine is not sufficient, we will need to announce an end-of-life for unauthenticated DHCP and turn that service off.

Private Network

A private network is one that is isolated from the rest of the internet. The devices either are not connected to the internet, or are connected through a firewall.

The Instrumentation Lab has setup a private network in an effort to protect their assets from intruders on the internet. The IP addresses of the devices are not routed or proxied, however there are several machines which are physically connected to both their private network, and the departmental public network.

Because traffic between the Instrumentation Lab private and departmental public networks is currently being bridged, there have been at least three incidents where network traffic which should have been isolated to the Instrumentation Lab has bled onto the departmental network resulting in a denial of service for departmental users. The most recent of these incidents occurred on Thanksgiving Day causing the departmental mail server to repeatedly crash until I disconnected the Instrumentation Lab computers from the rest of the network.

We should establish a firewall device to truly isolate the Instrumentation Lab "private network" from the rest of the departmental network. The firewall device can be configured to use a "passive mode" so that the Instrumentation Lab machines could be configured for either their private network or the departmental network. The firewall will have the benefits of protecting the instrumentation lab from outside intruders, as well as protect the departmental network from Instrumentation Lab traffic.

The firewall device could be a simple Intel based PC with two network-interfaces running OpenBSD and the OpenBSD Packet Filtering tool (PF). There are many commercial products[4] which are nothing more than commodity PC equipment with this same configuration.

Recommendations: My recommendations regarding our network infrastructure include the following:

1. Purchase network electronics with fiber-optic interface ports and move the network connection to the UF network to the fiber-optic cable in the 4th floor telecommunications closet.
2. Install a fiber-optic backbone between the telecommunications closets.

4 The Crunchbox Firewall Device, http://www.shopip.com

3. Move the network infrastructure so that each telecommunications closet feeds the network drops for its' own floor.
4. Continue to migrate our remaining workstations to DHCP.
5. Contact Kathy Bergsma, Jordan Wiens, and Chuck Logan from Network-Services Security and determine that status of our unauthenticated DHCP.
6. Install a firewall running OpenBSD and PF between the Instrumentation Lab and the rest of the departmental network.

Network Services Takeover

In my previous report I discussed the possibility of Network-Services managing all campus networks 'to the face plate' with the goal of improving service while saving costs.

There has been no announced change in the plan, and there have been no announcement of the fees that will be borne by departments transitioning to this service. It is still unclear if, or when, Network-Services will wish to nationalize our network.

It is still my opinion that we should wait to turn our infrastructure over to Network-Services until we can get a clearer understanding of the costs that will be associated with their service. In the interim, we should still continue to work closely with Network-Services and provide them with any assistance or documentation that they request. We should not let the prospect of turning our network infrastructure over to another organization prevent us from performing needed upgrades.

Recommendations: It is my recommendation that we proceed with improving our network infrastructure even if we will be turning it over to another organization within 24 months.

User Accounts, Services, and Disk Storage

The department provides system accounts for all faculty, grad students, and staff members. This includes post-docs, adjunct faculty, and external collaborators. Undergraduates may receive an account at the request of their advisor.

All of the accounts receive certain 'birth right' services. These services include electronic mail, disk storage, and web-publishing.

Electronic Mail

We provide e-mail for all of the departmental users. Each user automatically receives an e-mail address of *username@astro.ufl.edu* when they receive an Astronomy account. Users may remotely access their email through the IMAP and POP protocols, or they may use the *SSH* utility to login to our network to check their mail.

In December, 2002, we enabled the SpamAssassin[5] mail filtering tool to reduce the number of unsolicited commercial emails that our users receive. Through

5 SpamAssassin, mail-filtering tool, http://www.spamassassin.org

the use of simple filtering rules, our users can automatically discard their unwanted spam. We developed this service at the request of many faculty and staff that found themselves overwhelmed by the large amount of "junk email" that they received, and it has been successful.

There have been two recurring requests from various faculty and staff in order to improve our e-mail service. The first would be to install a virus filtering system so that all incoming e-mail is scanned for viruses, and any infected attachment is automatically removed. The second request has been to provide a web-interface for remote mail access, similar to the Gatorlink webmail[6] or Yahoo!® web-mail system. Although it is technically feasible to implement both virus filtering and webmail systems, it is not possible to do so with our existing server hardware. When we replace the *davinci* server chassis, we will be able to develop these new services.

Disk Space and Storage Capabilities

Ever since December, each user in the department is given a home directory on our NFS server, *woodstock*. The home directory is on redundant disk on a server with redundant power supplies, and is backed up nightly. Prior to December, a users home directory could have physically resided on any of the workstations in the department, and most likely was not backed up.

Each user may access their home disk space in any of four different methods. Users may access their disk space by logging into any of our Unix and Linux workstations, their home space will be mounted as */astro/homes/username* and may also be accessed by the macro *~username*. Users may access their disk space through Windows Networking (SAMBA), by mounting *\\astrosmb\username.*[7] Users may access their home space through *SCP*, which is an extension of the SSH protocol. Finally, users may also access their home space through the *FTP* protocol through polaris.astro.ufl.edu. However we do not recommend using FTP, because there are inherent security flaws with the protocol and a users password may be compromised; users should use SCP instead of FTP.

By default, every user receives a disk-storage *sanity limit,* which allows them to store up to one gigabyte of data in their home directory. When a user exceeds their sanity limit, they are automatically given a 250 megabyte temporary extension by the server, and notified via e-mail that they have reached their disk storage limit. The primary purpose behind the sanity limit is to prevent a user process from accidentally consuming all of the available disk space and adversely affecting the other users of the system.

Any user that needs additional disk storage for academic purposes may request a permanent increase in their storage limit from the departmental IT staff. We typically increase the capacity in 10% increments.

Web-Publishing

Every user is able to publish their own web-pages. The pages are accessible

6 Gatorlink Webmail, http://webmail.ufl.edu

7 Users may need to have their "SAMBA Password" set by the IT Staff to access their space through Windows networking.

through the url *http://www.astro.ufl.edu/~userid*. In order to publish a web-page, the user must create a directory named *public_html* under their home directory. After the initial directory is setup, all the user needs to do in order to publish a web-page is store their html files under their public_html folder.

IT Staffing

The Department of Astronomy currently has 2.0 FTE consisting of one TEAMS System Manager and one TEAMS Support Specialist.

Although we are making great strides for having a homogenous system, we still have much work to do before we are done. When special projects arise, such as space relocation, the IT staff have been left in a "triage mode" and barely able to keep up with the job queue. Additionally, special requests, such as new software package installations, have dramatically reduced our ability to provide end user support since January 6th.

During the past few months the departmental IT staff have been asked to take over the computer management responsibilities for various groups within the department. I am proud that we have been able to gain enough trust from these groups that they wish our support in managing their devices. However, I am concerned that the responsibility of these additional machines will overload the IT staff. For instance, since June 2002, the number of servers that we manage has more than doubled, while our available manpower has not increased.

There is currently a proposal to have the departmental IT staff take over responsibility for all of the Windows PC's in the Instrumentation Lab[8]. Many of these PC's will need to have their operating systems re-installed, service packs applied, and anti-viral software updated. This work will further limit the ability of the departmental IT staff to provide the level of support we consider adequate to the remainder of the department.

Although I am very much in favor of this proposal, I am concerned that we may not be able to effectively take on the new support tasks with our current staff. We are still in the process of correcting many of the shortcomings in our system configuration, and the impact of assuming new responsibilities will reduce our ability to continue to improve the quality of our services.

Last summer I conducted an informal survey of other units on campus to get an idea of how many PC's each unit supports, and the number of staff they have in place to provide that support. I have once again conducted an informal survey among IT departments across campus. However, this time I am also including information about the number of servers and operating systems each unit supports. The updated survey is included in Section 4.

Most of the respondents have a support staff to workstation ratio of around 1 staff member for every 60 workstations. At one FTE per 70 workstations, the Astronomy IT Staff already have a higher number of workstations to support per FTE than the majority of respondents.

8 Internal Memo from C. Packham, included in Section 4

Although using a number of FTE per workstation supported does provide us with a rough idea of the workload, it should not be the only factor taken into account.

For example, although it appears that the Network Writing Environment has an easier support burden than many of the respondents, especially considering X-Terminals and SunRays require very little support, it must be considered that they also support over 1500 users in their lab, which increases their workload immensely. In contrast to the Network Writing Environment, the College of Health and Human Performance has a very homogenous network of Windows 98 and Windows 2000 workstations. Because the majority of their workstations are identical, the support burden is reduced. When a problem machine acts up, they are able to re-image the machine and it will again behave like the other machines in their organization.

In comparison to the other units on campus, if we were to take over management of the Instrumentation Lab machines, we will be substantially understaffed. The Astronomy IT Staff support the second largest number of servers, and one of the broadest variety of operating systems. We have several machines with unique hardware configurations, and several machines with unique software requirements. If we are to take on the extra support tasks, we will need to hire a student-OPS person for between $7.50 an hour to $8.50 an hour, for up to 20 hours a week to make up the staffing shortage.

Software and Licensing

The department uses both commercial and free software in order to get work done. In accordance with federal copyright law[9], and the UF Acceptable Use Policy, we may only install and use software that we have valid licenses for. Some of the commercial software packages that we use have recurring license fees, while others have one-time purchase fees.

The following commercial software packages have annually recurring fees:

Package	***Fee***
IDL Maintenance	$2,000.00
Sun Scholarpac	$150 buy in, $24 per workstation. This year was $366.00
Maple	$50.40 per license. This year, $302.40
Matlab	$375.00
X-Win32	$360.00
AutoCAD	$200 per license. This year, $400.00
StarOffice maintenance	$100.00

9 Http://www.copyright.gov

Our annually recurring licenses cost us approximately $3900 per year. This amount may vary if our license needs change, or if the cost of the product changes.

We also use the following commercial software packages which have a one time purchase fee:

Package	***License Cost***
MS-Windows	$95.36
MS-Office	$48.36

Microsoft Licenses

David Edmeades performed an internal audit of our software licenses during the last week of January, 2003. According to the preliminary results of the audit, the department may need to purchase licenses for Windows 2000 and Microsoft Office 2000 in order to be legal.

The preliminary results of the audit show that the department may need to purchase as much as $1,800 worth of licenses. Please note, this estimate is a first glance, and before we have had a chance to speak with the primary users of the machines to see if they have purchased licenses. The final cost may be lower, but it is likely we will have to spend some amount on Microsoft Licenses.

Section II: Goals and Areas of Focus

This section covers areas that we would like to improve upon. Although we have made positive steps forward in some of these areas, we believe we still have room for improvement during the next fiscal year.

Documentation and Training

Proper documentation has two forms. The first form is internal documentation, which provides information on operating systems, hardware, application installation, network diagrams, and other reference material for the system administrators. The second form, external or end-user documentation, is documentation that can be given to users to explain how to accomplish tasks, use applications, etc. Training refers to both training and enrichment for the system administration staff, as well as training for end users on the use of the systems.

Documentation

Since last August we have been endeavoring to provide both internal and end-user documentation. In September we established a departmental computing web-site at http://www.astro.ufl.edu/it, and have slowly begun to populate it with information.

Internal Documentation

We have established policies for the installation of new applications. Applications that require compiling have log files created during the build process, as well as other notes specific to the application. These notes are stored in the directory /astro/depot/packagename/depot and are intended to be a resource for the systems staff.

Applications which do not require special compiling, or are more involved and require careful interaction of multiple applications, are thoroughly documented and made available through our web-site. For example, the installation of our mail server requires the interaction of several different applications. The documentation describing the process in detail is online at http://www.astro.ufl.edu/it/install/postfix.html.

We have also established a shared directory on the network where the administration staff can store other internal documentation. Our network maps, installation instructions for various devices, and other critical information is stored in this location.

External Documentation

External documentation, or end-user documentation, is geared towards supporting departmental users. This documentation is made available through a web-interface, so that users have an easily accessible place to go for simple questions.

Prior to August, there was no end-user documentation in the department. When we established the departmental computing web-site, we began creating end-user documentation. Unfortunately, the process of writing documentation is time consuming, and we have only been able to devote a limited amount of our time towards this task.

We have made available documentation explaining how to configure common email clients with Spam-Assassin. We have also started a "Frequently Asked Questions" page[10] which contains the answers to commonly asked questions.

Although we have started producing end-user documentation, we have room for improvement in both the quality, and the content, of our documentation.

End User Training
As new users join the department, we should provide basic training to them. We should explain how to login to the system, how to access their email, and some basic information on the applications we support.

Although the systems staff are not qualified to describe the intricacies of using IRAF or IDL, we are capable of explaining how a user can start up an IDL session, or show a user what FITS viewers we have available. We can offer a training program at the start of each semester, and coordinate it so that all new faculty, staff, and grad students may attend. We should also offer one-on-one training as needed.

Systems Staff Training
The IT staff should also be given the opportunity to seek additional training. As technology changes, IT staff have to constantly keep up to date with security patches, new software versions, new hardware specifications, new operating systems, etc.

It is also beneficial to network with other institutions, and see how they are meeting the same goals. Perhaps they have a solution that works better than ours? Or perhaps they have had a problem with a solution that we should avoid? This type of feedback can be very useful in making future technology decisions.

This March I will be attending the SANS Institute Security Mini-Conference being held at Virginia Tech. Although I am paying for the conference out of my own pocket, I am doing so because I feel the knowledge I will gain will be beneficial to the department, and justifies the meager cost.

We should try to establish a budget so that David Edmeades may also receive external training. Specifically, I would like to see the department sponsor David to receive Windows 2000 and Windows XP network and desktop support training. I believe that this training would be invaluable to the department as it will improve his ability to support the Instrumentation Lab Windows machines.

Establishing an Annual Budget

The Department of Astronomy needs to establish an annual budget for computing. This budget should include computer replacement costs, server depreciation costs, annual software licenses, staff training, and infrastructure upgrades and depreciation.

An estimated budget for IT would be close to $50,000 annually. This does not

10 Http://www.astro.ufl.edu/it/docs/faq.html

include staff salaries.

A proposed budget breakdown is as follows:

Item	***Quantity***	***Unit Cost***	***Amount***
Replacement PC's	20-25	$1,250.00	$25,000.00-$31,500.00
Server Depreciation	Annual Depreciation	$5,000.00	$5,000.00
Annual License Renewals	Annual	$3,900.00	$3,900.00
Network Infrastructure	Depreciation and Upgrades	$2,500.00	$2,500.00
Staff Training	2 conferences (1 per staff member)	$1,500.00	$3,000.00
Miscellaneous Consumables			$3,000.00
Total:			***$42,400-$48,900***

Section III: Departmental Computing Needs

This section is a summary of our computing needs for the next eighteen months. It includes both critical needs that we must take care of, and it also includes a section on computing needs that we would like to resolve in an ideal world.

Department of Astronomy Computing Needs (critical)

All of the items listed under the critical heading must be done in order to maintain a stable computing environment.

Desktop Computer Replacement

The Gartner Group recommends a maximum PC service life cycle of three years for "power users" and a life cycle of up to four years for low-end users.[11] Our grad students and post-doc students should be considered "power users" because of the data analysis they perform. Unfortunately, we must accept that with reduced budgets, it is impractical to replace machines within a three year life-cycle. However, maintaining machines for more than four and a half years becomes impractical. It is often expensive and time consuming to try and keep these older machines running.

Assuming a four to five year life-cycle for desktop computers, the following machines currently in use should be replaced during the remainder of this fiscal year. All of these machines are older than four years old, and several of them are older than five years:

Decal	***Purchase Date***	***Primary user classification***
4910-AA-137117	12/1996	Faculty/Research
4910-AA-138074	2/1997	Faculty
4910-AA-138972	5/1997	Faculty
4910-AA-139800*	5/1997	Grad student/scanner
4910-AA-138969*	5/1997	Grad student/scanner
4910-AA-143212	6/1997	Grad Student
4910-AA-145878	6/1998	Staff
4910-AA-146763	7/1998	Faculty
Non-decal (giralda)	8/1998	Grad Student
4910-AA-149001	10/1998	Faculty
4910-AA-149003	10/1998	Grad student
4910-AA-149000	10/1998	Grad Student

* Machine decals were recovered

11 Gartner Group.
Desktop PC life: Four years for the mainstream.
Http://www.techrepublic.com/article_guest.jhtml?id=r00320011219ern01.htm

The estimated cost for replacement machines is $1,140 per unit, or $13,680 for all of the above units. Sample replacement machine configuration:

> Dell Optiplex GX260, 1.8Ghz processor, 512MB RAM, 40GB hard drive, 19" Dell M992 monitor, 4 year parts/on-site labor (next day), ATI radeon video card, $1140/ea.

The following machines will need to be replaced during FY 2003-2004:

Decal	***Purchase Date***	***Primary User Classification***
4910-AA-144694	11/1998	Grad student
4910-AA-150687	1/1999	Grad student
4910-AA-155698	9/1999	Staff (engineer)
4910-AA-155244	11/1999	Faculty (scientist)
4910-AA-150685	1/1999	Faculty (scientist)
4910-AA-155225	8/1999	Grad student
4910-AA-156408	11/1999	Post-doc
4910-AA-150684	1/1999	Faculty
4910-AA-156184	10/1999	Post-doc
4910-AA-150682	1/1999	Faculty
4910-AA-155857	10/1999	Faculty
4910-AA-156181	10/1999	Grad student
4910-AA-156183	10/1999	Faculty
4910-AA-150681	1/1999	Grad student
4910-AA-156407	11/1999	Faculty
4910-AA-156083	1/1999	Faculty
4910-AA-155220	8/1999	Grad student
4910-AA-155222	8/1999	Grad student
4910-AA-155224	8/1999	Grad student
4910-AA-155221	8/1999	Grad student
4910-AA-155219	8/1999	Grad student
4910-AA-154239	6/1999	Grad student
4910-AA-155223	6/1999	Grad student
4910-AA-156410	11/1999	Faculty (scientist)
4910-AA-150686	1/1999	Grad student

The estimated cost to replace 25 machines during fiscal year 2003-2004, based on a $1,140 per unit replacement cost, is $28,500.

I have spoken with a couple of the primary users of some of these machines, and it is likely that some of them will be replaced through grant funds during the remainder of this fiscal year.

Desktop Computer Upgrades

Ideally every workstation should have a minimum of 256mb of memory, a video card with 8mb memory, and 10GB disk storage. The following machines will not be replaced during the next 18 months, so these machines should receive hardware upgrades to bring them up to the minimum specifications.

Decal Number	***Type of Upgrade***	***Estimated Cost***
4910-AA-164885	256mb	$50.00
4910-AA-156409	256mb	$50.00
4910-AA-164879	256mb	$50.00
4910-AA-159272	256mb	$50.00
4910-AA-159272	Video card	$40.00
4910-AA-159271	256mb	$50.00
None (gsmith)	256mb	$50.00
4910-AA-164881	256mb	$50.00
4910-AA-159273	256mb	$50.00
4910-AA-164878	256mb	$50.00

Estimated cost to bring the remaining machines within the department up to the minimum specifications, $490.

Server Chassis

The Department of Astronomy has two “servers” which should be replaced.

The first server, *polaris*, is the departmental login, dhcp, and dns server.

The second server, *davinci*, is the departmental mail server.

Both machines are currently desktop grade machines which were put into production as servers. They should be replaced with true server class machines, including redundant power supplies, disk subsystems, and sufficient memory.

A sample configuration for a replacement server chassis is a Dell PowerEdge 1650, 1.2Ghz processor, 1GB of RAM, PERC3-DI Raid controller with hot-plug capability, 36GB 10,000 RPM Ultra 160 SCSI hard drive, dual ethernet adapters, dual power supplies.

Each unit in this configuration is $1,713. Total cost for replacing both chassis is $3426.

Software Licenses

Microsoft Licenses

David Edmeades performed an internal audit of our software licenses during the last week of January, 2003. According to the preliminary results of the audit, the department will need to purchase licenses for Windows 2000 and Microsoft Office 2000. The preliminary results show the department may have to purchase as much as $1,800 worth of licenses to be legal.

Linux

Although the components in the RedHat Linux operating system are free, RedHat has announced a change in their licensing and support structure. Effective December 31, 2002, RedHat will only provide software support for 12 months after initial release for their Desktop Linux product. This means that all current versions of RedHat will not be eligible for security patches and software updates after December 31, 2003.

There will be a commercial desktop product which RedHat has pledged support for up to five years, due to be released at the end of March, 2003. RedHat has not announced their new pricing structure for their commercial desktop product. I currently do not have a suggestion regarding this item.

Annual Software Renewals

We have several licenses which must be renewed each fiscal year. The software licenses which must be renewed annually include:

Package	***Number of Licenses***	***Total Cost***
Sun Scholarpac	9	$366.00
Maple	6	$302.40
Matlab	Unlimited	$375.00
X-Win32	Unlimited	$360.00
AutoCAD	2	$400.00
Soffice Support	1	$100.00
IDL Maintenance	50	$2,000.00

As long as our license counts and the renewal costs do not change, our annual software renewal costs are $3,904.

To summarize our critical computing needs over the next 18 months:

Item	***Cost***
Workstation Replacements (FY2002-2003)	$13,680.00
Workstation Replacements (FY2003-2004)	$28,500.00
Replacement Server Chassis	$3,426.00

Item	*Cost*
Software Renewal	$3,904.00
Microsoft-Licenses	~$1,800.00
Total:	$51,310.00

Department of Astronomy Computing Needs (Ideal)

Although the following items are not required during the next 18 months to maintain a stable computing environment, they are included as wish-list items.

Lab Computers

The Astronomy Lab in 301 is comprised of 10 Pentium-120 machines running Windows 95. They were purchased in January 1996, and have no network capabilities.

They should be replaced with modern workstations which can be connected to the internet, and are fully capable of running recent applications. Using the price quote for the Dell Optiplex GX-260's quoted above, it will cost $11,400 to replace the machines in the lab. Please note, this price does not include network infrastructure upgrades which will be required to provide network connectivity for the new machines.

Network Infrastructure

Currently, the majority of our network drops are terminated in the SSRB 2nd floor telecommunications closet. In keeping with campus standards, new network drops that have been pulled during FY 2002-2003 were terminated in the telecommunications closet on the same floor of the new installation.

The goals for a network infrastructure upgrade include:

1. Complying with UF telecommunications standards.
2. Keeping the network topology simple.
3. Providing improved network performance for the departmental users.

Our network infrastructure upgrade consists of three phases.

- Pull back the network drops from the 2nd floor communications closet so that each network drop will be terminated in the telecommunications closet that is on the same floor.
- Install a fiber-optic “building riser” between each floor in the department.
- Purchase new network electronics to replace the 10MB electronics, and allow us to use a fiber-optic backbone.

Phase I of our network infrastructure upgrade will be relatively simple and inexpensive. We will need to purchase new Category 5E-568A termination blocks for each floor, but we could use our own labor to do the work. Phase I would bring our network infrastructure in compliance with the university recommended network infrastructure guidelines.

The estimated cost to complete Phase I is between $750 and $1000.

Phase II & III of our network infrastructure upgrade must go hand in hand. A fiber-optic building riser will only be useful with network electronics that are capable of using fiber-optics. The advantages we would gain by having a fiber-optic backbone included improved bandwidth between floors, improved network performance by reducing network collisions and transmission errors, and providing electrical isolation for the network of each floor.

It will cost us approximately $5,000 to have a fiber-optic building riser. This work will have to be done by an outside contractor.

Phase III of the network infrastructure upgrade includes purchasing new network electronics. We will need to purchase four new departmental work-group switches with fiber-optic uplink ports. The Dell PowerConnect 3248 48-port managed switches have been endorsed by staff in the Deans Office. Four new 3248 switches with the SFP fiber-optic uplink port will cost $1,138 a piece, or $4,552 for all four.

Printer Replacement

The “Office” and “Thirdfloor” printers were purchased in 1994. These are general purpose printers used by faculty, students, and staff within the department. Because of their age, obtaining replacement parts for the printers is expensive and costly. They should be replaced as soon as possible with new HP printers.

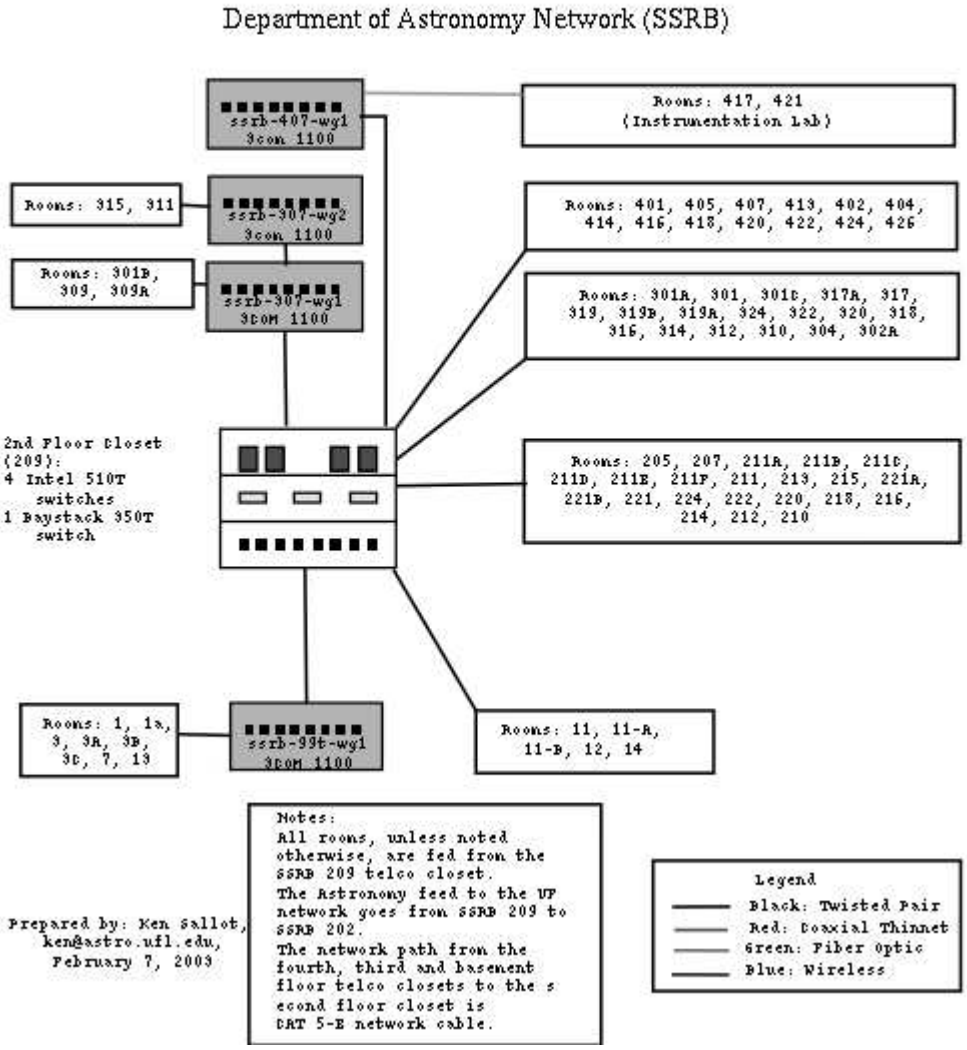
Estimated cost, $1,500 each, or $3000 for both.

To summarize our computing needs in an ideal world:

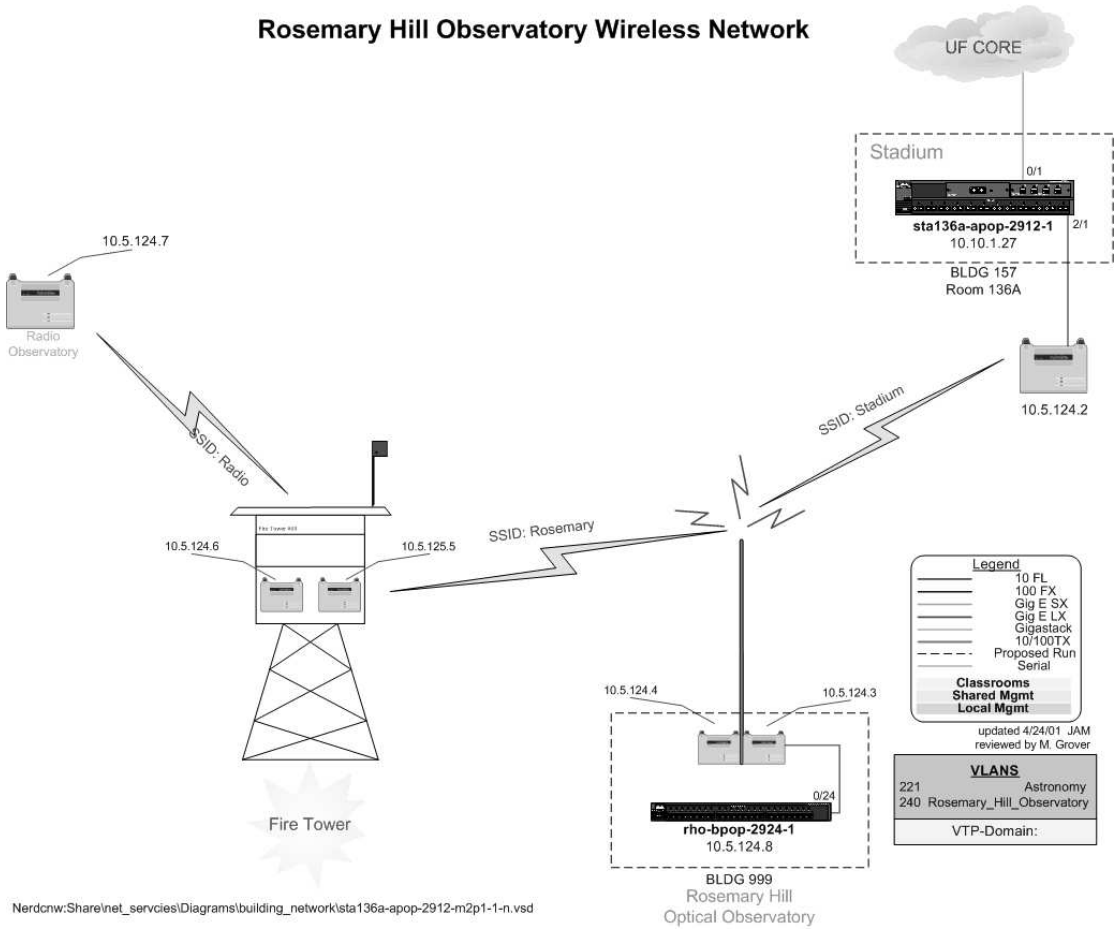
Item	***Cost***
Our Critical Computing Needs	$51,310.00
Replace All Lab PC's	$11,400.00
Phase I Network Upgrade	$1,000.00
Phase II Network Upgrade	$5,000.00
Phase III Network Upgrade	$4,552.00
Replace 2 printers	$3,000.00
Total:	$76,262.00

Section IV: Appendixes and Documentation

Astronomy SSRB Network Diagram



Rosemary Hill Network Diagram



Department of Astronomy
College of Liberal Arts and Sciences, University of Florida

Account Application

Instructions: Fill in ALL of the requested information. Please type or print legibly.
Return the completed form to 221 Bryant Hall

Check all that Apply	Logins: [__] Unix (email/web) [__] Windows	[__] New User [__] Renewal / Change [__] Temporary/Guest	
Date		**Expected leave Date**	
Last Name		**First Name and MI**	
Gatorlink Userid*			
Special Instructions			

** You must have a valid Gatorlink userid. To create one, see http://gatorlink.ufl.edu. Visitors ineligible for a Gatorlink account must speak with the system manager for approval.*

Street Address			
City, State, Zip Code			
Primary Email		**Other Email**	
Campus Phone		**Home Phone****	

*** For contacting you about your account in emergencies only.*

Classification	[__] Faculty [__] Staff [__] Postdoc [__] Grad [__] Undergrad [__] Guest [__] Other (Specify) *		
** Sponsor required, please get Faculty or Staff signature and Email address*			
Sponsor Signature		**Sponsor Email Address**	
Administrative Use Only			

The use of computer facilities is a privilege and not a right. Users must abide by all Department, University, State, and Federal rules and regulations regarding the use of such accounts. Computer accounts are to be used **only by the person for whom the account was created. Do not give away or share your password.** Accounts are not to be used for inappropriate activities, such as commercial user without specific University permission, or for cracking or otherwise breaking into department or other computer accounts and/or systems. See the University Acceptable Use Policy at: http://www.it.ufl.edu/policies/aupolicy.html for more details. All accounts are required to have a good "uncrackable" password; A good password is difficult to guess, it contains alpha, numeric and shift characters, it cannot be found in the dictionary.

The Department of Astronomy offers computer accounts to any faculty, graduate student, or staff member within the department. This also includes post-doctoral students and adjunct faculty. Undergraduate students majoring or minoring in Astronomy may receive an account after approval from their advisor. All users except faculty and staff are required to have a department sponsor. Computers in the Astronomy Department are property of the State of Florida. Use of departmental machines and the departmental network are intended to support University-sanctioned research, educational, and administrative functions. Use beyond these purposes is governed by The University of Florida Acceptable Use Policy, cited above.

Agreement: I understand and will abide by these terms and those specified in the **University Acceptable Use Policy**. Possible penalties for failure to comply with the terms include the revocation of computing privileges, punitive action from the University, and legal action by the Department, University or Government.

Signature (required)		**Date:**	

IT Staffing Survey

During the first and second week of February 2003, I conducted an informal survey of IT staffing at various units across the UF campus. The survey consisted of the following six questions:

1. How many workstations does your department support?

2. What is your total FTE to support those machines? Please include OPS staff as fractional fte (40hrs=1.0 fte).

3. How many different operating systems do your staff support? Please group Windows operating systems as follows: Win95/98, Windows NT, Windows 2000/XP.

4. What operating systems do your staff support?

5. How many servers do your staff manage?

6. Is your staff responsible for managing network infrastructure and electronics?

Below are the results, including an executive summary for each organization surveyed.

Dept	***Number of Workstations***	***Number of Servers***	***Number of OS'es***	***FTE***
Astronomy	140	14	5	2
DCP	186	4	6	3
The NWE	160	6	1	3.25
DOCE	60	11	3	5.5
CISE	300	35	6	7
Statistics	62	7	4	1.5
HHP	350	6	2	4.25
Mathematics	119	4	3	1.5
HP	430 PC's, 60 PDA's	7	7	8.4
Office of Academic Technology	700	7	4	10
College of Law	376	7	5	6.4*

Executive Summary of respondents:

The Department of Astronomy IT staff manage 140 workstations and 14 servers. They support the Windows 95/98, Windows 2000, FreeBSD, Solaris, and Linux operating systems. They manage their departmental network, and they have 2.0 FTE. Astronomy currently has a very diverse collection of workstation hardware and software configurations, and has one of the highest ratios of workstations supported per FTE. Astronomy also

manages the largest number of servers of any of the groups surveyed.

The College of Design, Construction, and Planning IT center manages 186 workstations and 4 servers. They support the Windows 95/98, Windows NT 4.0, Windows 2000, Windows XP, Linux, FreeBSD, and NetWare operating systems. They do not manage their departmental network, and they have 3.0 FTE. DCP currently has a rather diverse configuration for their workstations, however they have 1 FTE for every 62 workstations supported.

The Network Writing Environment, within the College of Liberal Arts and Sciences manages 160 SunRay and X-Terminal workstations. They support the Solaris 8.0 operating system and run 6 servers. They have limited management duties over their network infrastructure, and they have 3.25 FTE. At one FTE for every 49 workstations supported, it must be noted that SunRay and X-Terminal workstations have no moving parts and require less maintenance. However they manage over 1500 user accounts in their lab environment, which increases their support burden.

The Department of Continuing Education manage 60 workstations and 11 servers. They support the NetWare 5.0, MS-Windows 2000 Server, MS-Windows 2000 Workstation, and XP operating systems, and manage their network infrastructure. They have 5.5 FTE, however 2.0 FTE are used to develop in-house database and programming projects for use with Distance Education and content delivery. Their ratio of FTE per Workstation supported at 1 FTE per 10 workstations should be considered an outlier and discounted because several of their FTE are devoted to other tasks.

CISE – The Computer and Information Science and Engineering IT staff manage 300 workstations and 35 servers. They support the Solaris, Linux, IRIX, FreeBSD, Windows NT, and Windows 2000 operating systems. Although at 1 FTE per 42 workstations supported it might seem that CISE has ample staff, it must be taken into account that they manage 35 various servers as well as their own networking.

The IT Staff for the Department of Statistics support 62 workstations. 35 of the workstations run the Solaris operating system, the remainder run Windows. They support the Windows 95, Windows 2000, Solaris and Linux operating systems with their 1.5 FTE. Their FTE to workstation ratio is one FTE per 41 workstations, however they do manage several servers.

The College of Health and Human Performance IT staff manage 350 workstations. 47 of these workstations are laptops that the faculty use in conjunction with their desktops. They support the Windows 98 and 2000 operating systems. They also manage 6 servers and are responsible for their network infrastructure. Although they have 4.25 FTE, one of the FTE has primary duties outside of supporting computers and only provides ancillary desktop support. Although they have the highest number of computers support per FTE, with 1 FTE per 82 workstations supported, they have a homogenous system with identical hardware and software configurations on their workstations.

The Department of Mathematics IT staff manage 95 Unix workstations running the Solaris 8 operating system, 22 PC's running Windows 2000, and two MacIntosh computers. They manage four servers running Solaris 8. They support three different operating systems. They only have 1.5 FTE, but are not responsible for managing their building network. Although they have the second highest ratio of workstations supported per FTE at 1:80, they have identical software configurations for their Sun and Windows workstations minimizing their support burden.

The College of Health Professions support 340 desktops located on the University campus, 70 home PC's, 20 laptops, 55 PalmOS handheld devices and 5 Windows CE handheld devices. They have a staff of 8.4 FTE, however 1.3 FTE is devoted to web and course-content development. They support seven different operating systems, including Windows 98, Windows NT 4.0, Windows NT Server 4.0, Windows 2000, Windows XP, Linux, NetWare 5.1, PalmOS, and Windows CE. They manage seven servers, but do not manage their own physical network. They have 1 FTE for every 51 workstations supported.

The Center for Instructional Resources and Computing Activities and Office of Academic Technology have roughly 700 workstations running the MacIntosh and Windows 2000 Operating systems. They support the MacIntosh, Windows 2000, NetWare 5.10, and Linux operating systems. They manage 7 servers. All of the workstations in their public lab have an identical software image installed on them, and are locked down so users may not make system changes of the software. They have 10 FTE devoted to supporting the labs and staff and they are not responsible for managing their network infrastructure. They have 1 FTE for every 70 workstations supported, the majority of which have identical software and hardware configurations.

The Levin College of Law IT Staff support 376 workstations with 6.4 FTE. However, they currently have two vacancies dropping their current FTE down to 4.4. They support five different operating systems: Windows 95/98, Windows 2000, Windows NT 4.0, Linux and NetWare. Their staff manages seven servers, and they manage their own network infrastructure. The Law School has an average ratio of FTE per Workstations at 1 FTE per 59 workstations supported when they have no position vacancies.

Instrumentation Lab Memo

memo

Date: 2003-01-31

To: Raines, R. Julian, Hou, Varosi, J. Julian, Hanna, French, Cawlfield.

Cc:

From: Chris Packham

RE: Instrumentation Group Computing

Dear all,

I'd like to present this document as a basis to discuss what level of computing help we can expect from the department's computing administration. We need to agree between us what we need, and I'll then present this to the instrument oversight committee who can then decide (hopefully rubberstamp) the resources and get our system admin. to implement the changes.

Currently in the instrumentation group, we receive no support from the department's system administrators. The windows users therefore operate largely without proper sys. Admin. and backup, which eventually will lead to someone loosing a large volume of work. Also, we must maintain device compatibility with the windows boxes. On the UNIX side, we have to administer our own backups and sys. Admin. I suggest the following requests to the department's sys. Admin for our computing needs:

Windows

Problem	Proposed Solution
Machine maintenance & software upgrades left to users.	All windows boxes to be fully (i.e. O/S & MS office apps) maintained by department.
Little or no virus protection	All windows boxes to have virus software installed and maintained by department.
Machine backup left to users.	All windows boxes user areas to be backed up by department on a daily basis
Device compatibility administered by users	All windows boxes compatibilities to be maintained by department.

UNIX

Problem	Proposed Solution
Machine backup left to users.	All UNIX boxes data areas to be backed up by department on a daily basis
Little or no access to department's software utilities (i.e. IRAF, Starlink, etc).	Ability to use installed departmental software utilities.
Maintenance of private/public networks	No change.

I look forward to discussing these issues with you all. Best regards,

Chris Packham.