Appendix 9:
EUC Project Team Responses to Academic and Research Redesign Recommendations

The EUC Steering Group has identified various recommendations for the MiWorkspace redesign for the academic and research environment. The EUC Project Team has reviewed these recommendations, discussed the proposed responses to these recommendations with the EUC Steering Group, and finalized the responses. This appendix details these responses.

Support Model / Service Level
The EUC Project Team and MiWorkspace Program agree with much of the guidance and all of the spirit of information put forward in this section. The teams are aligned to the scope and high level location information. However, it is the opinion of the program leadership that neither the recommendations or the response are comprehensive or universal. It is not possible to address detailed requirements for each school and college in a general document, such as this. The program leadership, therefore, agrees with the EUC Steering Group that detailed unit discovery is the only place to address the unique service needs of each unit. The operating model anticipates and is designed to accommodate inevitable local service variances e.g., detailed tuning of the service features, addressing local expectations and culture for level of service, hours of operation.

Another key area for validation of these recommendations will be the upcoming pilots in LSA, School of Education, and the Library. The EUC Project Team recognizes concrete pilot experience will be critical to provide a detailed evaluation of each recommendation in the support and service section. This response document, therefore, addresses support and service recommendations in a general way, with the understanding that the team will update the responses as the pilots are implemented.

In addition to a need for additional information gathering during the pilot process, there are circumstances in which it would be impossible for any internal IT provider to meet the recommendation. For instance, but not limited to, the recommendation on page 11 of the report: "Installation of all hardware/software within three business days" does not take into consideration that lead times for acquiring hardware/software vary widely by vendor. Thus, there are circumstances in which a service provider would not be able to meet the recommended timeline. The project team is committed to responsiveness and timely service even when specific custom configurations require longer than three business days.

In summary, the service believes it can meet most of the recommendations contained in this section. As discussed above, unit-specific needs will be addressed as they emerge during detailed discovery, and clarification of ability to meet unit-specific expectations will emerge during the pilots. The project team will rely on the knowledge of the IT organization and others elsewhere in the unit to assist the service as they address these requirements. The service is confident that, in partnership with Senior Unit Leadership, it can meet the key emergent requirement, as well as all mainstream end user computing needs.
A. Service Customers  
To be developed

B. Service Locations  
To be developed

C. Academic Specific Services Groups / Centers  
To be developed

D. General Availability of Services  
To be developed

E. Response Times for MiWorkspace Services  
To be developed

F. Services Critical to Academic Mission - often unique to Academic and Research Units  
To be developed

Service / Feature Recommendations Summary  
The table below summarizes the services or features that were recommended by the EUC Steering Group, the title for each recommendation, and the priority assigned by the EUC Steering Group and the EUC Project Team.

<table>
<thead>
<tr>
<th>SERVICE / FEATURE</th>
<th>REQUIREMENT</th>
<th>EUC STEERING GROUP PRIORITY</th>
<th>EUC PROJECT TEAM PRIORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiWorkspace Printing</td>
<td>Follow-Me Printing</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Scan-to-Email</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Non-Networked Printers</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Vendor Sources for Printers</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
</tr>
<tr>
<td></td>
<td>Restricting printer access</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Printer Access Management Application</td>
<td>Nice to Have</td>
<td>Nice to Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Print access for users not in particular MCommunity groups</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Charging Printing Costs to Multiple Billing Accounts</td>
<td>Must Have</td>
<td>Nice to Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Guest Printing</td>
<td>Nice to Have</td>
<td>Nice to Have</td>
</tr>
<tr>
<td></td>
<td>Managed Printing for Linux Machines</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Data Collection and Reports</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td></td>
<td>Full-service option that provides consumables and service</td>
<td>Nice to Have</td>
<td>Out of MiWS scope</td>
</tr>
<tr>
<td></td>
<td>Assigning costs to multiple billing shortcodes</td>
<td>Nice to Have</td>
<td>No change (Done)</td>
</tr>
<tr>
<td></td>
<td>Print Quotas</td>
<td>Nice to Have</td>
<td>No change (Done)</td>
</tr>
<tr>
<td></td>
<td>Administrative Management Tools</td>
<td>Must Have</td>
<td>Nice to Have (Done)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MiWorkspace Windows</th>
<th>Tracking Machines with Easily Identifiable Naming Convention</th>
<th>Must Have</th>
<th>Alternate approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remote Desktop Protocol</td>
<td>Must Have</td>
<td>Must Have</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th><strong>MiWorkspace</strong></th>
<th><strong>Macs</strong></th>
<th><strong>Access to storage resources like AFS or NFS from a Mac configured for non-uniname users</strong></th>
<th>Must Have</th>
<th>Must Have</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MiWorkspace</strong></td>
<td><strong>Macs</strong></td>
<td><strong>Active Directory Groups to Manage Access to Specific Machines</strong></td>
<td>Must Have</td>
<td>Must Have</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td><strong>VLAN/DHCP Issues</strong></td>
<td>Must Have</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td><strong>HIPAA, ITAR, FERPA Requirements for Storage</strong></td>
<td>Must Have</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>Review Software Profile and Pathway to Software Rationalization</strong></td>
<td>Must Have</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td><strong>Maintenance and Upgrade Schedules for Switch OS</strong></td>
<td>Must Have</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>Discover Tool and Implementation Process</strong></td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td>Must Have</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>User Requests for Software</strong></td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td>Must Have</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>Updates for Lab Installation (Class Labs/Computer Classrooms, Open Labs)</strong></td>
<td>Nice to Have</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>ITAM</strong></td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td>Must Have</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>Ability to Turn Off Forced Software Updates</strong></td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td>Must Have</td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td><strong>MiWorkspace Equipment Loans</strong></td>
<td>Must Have</td>
<td>Must Have</td>
<td>Must Have</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MiWorkspace Purchasing Assistance (a)</td>
<td>Nice to Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MiWorkspace Purchasing Assistance (b)</td>
<td>Nice to Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MiWorkspace Purchasing Assistance (c)</td>
<td>Nice to Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracking non-MiWorkspace hardware in ServiceNow</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware inventory system does not track important departmental purchasing data</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage knowledge to improve purchasing power</td>
<td>Nice to Have</td>
<td>Nice to Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiServer / MiDatabase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inherent Bundling of MiServer/MiDatabase with MiWorkspace</td>
<td>Must Have</td>
<td>No change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Times for MiServer/MiDatabase</td>
<td>Must Have</td>
<td>No change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed of Deploying/Supporting New Versions of Server Operating Systems</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion of Firewall Information</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiWorkspace Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firewalls</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rollout</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full backup prior to initial reload</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drop off locations for computer reloads</td>
<td>Must Have</td>
<td>Nice to Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement of desktop support staff in “Day 1” activities</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Flexible Approach to Scheduling</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option to Defer Reload Until Computer Replacement</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password Syncing Campaign</td>
<td>Nice to Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option for Role-Based Deployment Scheduling</td>
<td>Nice to Have</td>
<td>Nice to Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiWorkspace Discovery Process</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Workforce Transition/Pre-Discovery Information Gathering</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order of Discovery and Workforce Transition</td>
<td>Nice to Have</td>
<td>No change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mission Specific Responsibilities and Filling Orphan Gaps</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiWorkspace Neighborhood IT Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information sharing and incident handoff between Neighborhood IT and Unit IT</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transitioning from an organizational model to a geographic model</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit involvement in Neighborhood IT personnel decisions</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retaining access to expertise</td>
<td>Must Have</td>
<td>Must Have (Done)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Must Have</td>
<td>Must Have</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BYOD / MYOD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to the network, collaboration tools, and departmental drives</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing from Personal Mobile Devices</td>
<td>Nice to Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Support</td>
<td>Must Have</td>
<td>Out of MiWS scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiWorkspace Linux</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fully-managed MiWorkspace Linux Service</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop easily-deployable Linux packages</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus initially on design / build of eight Ubuntu Long Term Support packages</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully support Red Hat Enterprise Linux at the earliest reasonable opportunity</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITS will pick up the Red Hat Enterprise Linux service if LSA discontinues providing this service</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceed with the Linux project plan as currently defined</td>
<td>N/A</td>
<td>Agreed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Classroom Computing**

| Focus on commodity IT services for classrooms | N/A | Agreed |
| Initially pilot podium computers in 110 classrooms | N/A | Agreed |
| Evaluate 210 class labs, 220 open labs, and 350 conference rooms during discovery | N/A | Agreed |
| Follow technical requirements for podium computers in 110 classrooms | N/A | Agreed |
| Follow technical requirements for in-room student computers in 210 and 220 labs | N/A | Agreed |
| Identified individuals will have general access to podium computers in 110 classrooms using Kerberos login | N/A | Agreed |
| Provide service and support to podium computers in 110 classrooms and student computers in 210 and 220 classrooms | N/A | Agreed |
| During discovery, evaluate whether certain classroom support / special tasks may be orphaned and determine shared staffing opportunities | N/A | Agreed |
| Provide one wired ethernet connection for 110 classrooms | N/A | Agreed |
| Equip 110, 210 and 220 classrooms with robust wireless capabilities | N/A | Agreed |
| Provide easy access and streamlined management of University licensed software on personal devices | N/A | Agreed |

**Research**

| Uniform first point of contact for support | Nice to Have | Agreed |
| Machine acquisition | Nice to Have | Agreed |
| Flexible load set | Must Have | Agreed |
| Support for dual boot configurations | Must Have | Agreed |
| Computers controlling research data collection devices | Nice to Have | Agreed |
| Discovery process | Must Have | Agreed |
| Expanded hardware support | Must Have | Agreed |
Existing MiWorkspace Services
The features (A through M) are currently in place for the Central Administrative Units. The EUC Steering Group has proposed new requirements to address the gap between the existing service and what is required for Academic and Research Units. Each of these recommendations have been reviewed by the EUC Project Team. A priority with details describing why or why not a recommendation has been agreed to has been provided for each recommendation.

A. MiWorkspace Printing

1. Follow-Me Printing
   Priority: Must Have (Done)
   Details: In the absence of single “per click” or “unified” print environment, MiWorkspace Print will provide clear communication regarding the expectations of the print platform. A unified print environment would provide a lot of simplicity to many of the requirements. At this point forward, we’ll use ‘unified per click environment’ as the title to describe a print environment where MiWorkspace Print either provides print hardware or manages the lease. In a unified print environment MiWorkspace may also provide some consumables and break/fix which would contribute to a per click rate.

   Procurement will ultimately be the authority in our capacity to stand up a unified print platform. We plan to pursue this conversation based on the requests in this document.

   A Unit seeing undesired growth in printed output, directly caused by printing from someone outside of the Unit, can have their printers whitelisted. The whitelist would prohibit printing from someone outside of the Unit.

2. Scan-to-Email
   Priority: Must Have (Done)
   Details: When a multifunction device (MFD) is configured with PaperCut (set-up with a card reader and PaperCut license), we also configure it with mail-relay. Scan to email is a core part of the service offering, and is available for a device with a card reader.

3. Non-Networked Printers
   Priority: Must Have (Done)
   Details: Part of the MiWorkspace detailed discovery process includes creation of an inventory for all printers in the Unit/Department. In this inventory, we separate networked devices from USB printers. If a Unit/Department has USB printers, they are installed by MiWorkspace Day 1 implementation staff or NIT and can be used alongside MiWorkspace system printers.
4. **Vendor Sources for Printers**  
**Priority:** Out of MiWorkspace scope  
**Details:**  
This will require discussion with Procurement. MiWorkspace Print has a presence on the PrintSmart project team, but is not involved in the RFP process for the print contract. We’ll actively pursue the feasibility of a managed hardware program that has other vendors.  

Ultimately, Procurement is the hardware authority for campus and will make the decision.

5. **Restricting Printer Access**  
**Priority:** Must Have (Done)  
**Details:**  
In our discovery process, we work with Units to identify any printers/groups of printers that may need to be whitelisted.

6. **Printer Access Management Application**  
**Priority:** Nice to Have (Done)  
**Details:**  
The application will not delegate whitelisting of printers or groups of printers, we will meet this requirement in our Unit discovery process.

Delegated departmental administrators will have the ability to create and manage MCommunity groups that control access to printing services. Specifically, group owners in MCommunity will control who can print on behalf of the given Unit.

The web-application will allow for input of groups which will then give those groups print privileges.

7. **Print Access for Users not in Specific MCommunity Groups**  
**Priority:** Must Have (Done)  
**Details:**  
A key part of our implementation is management of MCommunity groups for access provisioning. By default we will provision access for: RegularStaffAA, TemporaryStaffAA, FacultyAA, EnrolledStudentAA, and StudentAA into PaperCut. Users with only an enrolledstudentaa and studentaa affiliation will only be able to print to Sites printers by default. A department may wish to provision access to their printers for students or ‘other’ users with a uniqname. To accomplish this, they’d simply need to add the user to the MCommunity group which they are using to define who should print courtesy of the department.
MiWorkspace Print owns providing clarity for the different print possibilities.

8. Charging Printing Costs to Multiple Billing Accounts
Priority: Nice to Have (Done)

Details:
We currently have departments who have implemented multiple selectable accounts for their end-users, it is important to mention though, that no actual billing occurs. Reports are readily available for departments who wish to do internal reconciliation.

Automated billing would only be possible where MiWorkspace provides hardware/consumables in a unified environment.

The multiple selectable accounts feature is in scope for a MiWorkspace Print web-application, this application will be designed to help automate account and provisioning requests.

*After the implementation process, ongoing services will requests will be received and escalated through T1.

9. Guest Printing
Priority: Nice to Have

Details:
The ‘guest card’ solution is a part of the service specifically aimed so that Campus Computing Sites can provide print services for Library guest users. These cards will be available for distribution at Library circulation desks, as they are today. We will pursue a self-funding module so that guest users could adding funding to each card.

If a department has visitors or is holding a conference, and their guests need to print, they should do this through login on a domain machine, using a known shared account. If they must print from their own clients, then they’d need to follow our “non-managed” machine requirements, and login with a uniqname or known shared domain account. To receive a uniqname, the users would need to become have a sponsored affiliate account and be added to the pertinent departmental MCommunity group.

10. Managed Printing for Linux Machines
Priority: Must Have

Details:
The development of a printing package for MiWorkspace Linux is one of the deliverables for the Linux service. This Linux Printing package will be housed on the Ubuntu repository for easy access. We do expect to have a solution for non-MiWorkspace builds, users would just have to meet core requirements.
○ Must have a valid uniqname and UMICH password
○ Active Directory and Kerberos passwords synced. As of May 19th 2012, when you change your UMICH Kerberos password, your new password becomes synced to AD.
○ Must have a valid MiWorkspace Print MCommunity entry, if you are unsure if you meet this requirement, contact 4-HELP.
○ Must be connected to the MWireless network, or connected to a UM network via ethernet cable

Then follow ‘self-installation’ guidelines.

11. Data Collection and Reports
Priority: Must Have (Done)
Details: Reporting is available in PaperCut, users with elevated access have the ability to run a litany of available reports in PaperCut. We work to identify who should have elevated report access during the current MiWorkspace Discovery process.

12. Full-Service Option That Provides Consumables and Service
Priority: Out of MiWorkspace Scope
Details: We feel that this makes a lot of sense, and would be the linchpin for a seamless user experience. We plan to pursue this, but Procurement will ultimately need to sign-off as they are the owners of the Universities managed hardware service.

13. Assigning Costs to Multiple Billing Shortcodes
Priority: No change
Details: There are two requirements here:

○ Build a solution such that multiple shortcodes/accounts can be debited when a printer has a rate.
○ Develop an application where admins can manage rate setting, users, and billing shortcodes.

A more prudent approach to fulfilling this requirement would be a full-service unified print environment and we plan to pursue this approach. Multiple debitable accounts is a tool limitation and will not be implemented.

As mentioned above, we expect to develop an application that helps to delegate “some” level of print management.

14. Print Quotas
Priority:
No change

Details:
MiWorkspace Print will not be able to enforce quotas in decentralized hardware environment since this functionality is not currently viable with the tool. Quota accounts will be available for use in a unified print environment. We will ask the vendor about this as a future enhancement to PaperCut.

15. Administrative Management Tools

Priority:
Nice to Have

Details:
The scope of the application is such that an unauthorized user, general user, group owner, T1, NIT, and/or T3 Print Team can participate in an appropriate level of print account creation, management, view history, sync accounts, and delegate report running access. The application will not include printer grouping management, rate management/control, or access control.

Users will be able to create accounts, account names, account group (MComm group in which they are owner), and define shortcodes. Charging and quota accounts will only exist in an environment where MiWorkspace provides print hardware and some amount of consumables and break/fix.

Ongoing development of the web-application will be based on customer need and demand.

B. MiWorkspace Windows

1. Tracking Machines with Easily Identifiable Naming Convention

Priority:
Mitigate with Alternate Approach

Details:
We plan to make no change to the existing naming scheme, but will develop a simple method to view aggregated data about a machine.

We understand the importance of being able to associate machines to people, departments and custom configurations. We also understand the importance of being able to quickly pull this information.

A significant amount of discussion was had around this issue during the initial MiWorkspace design. As part of that conversation we identified a large number of attributes that would make sense to become part of a machine name. We could not settle on just a few that were most appropriate. We also realized that automating the creation of machine names based off of multiple varying criteria, and guaranteeing per-machine uniqueness would be challenging.

In the end, we felt that relying on computer naming for this information was not extensible
enough for our needs. We have chosen to stick with a simple naming scheme and rely on a machine’s Active Directory location, SCCM configuration and entry in an asset database to meet this need. We will develop a tool that pulls all of this information together into a simplified and easy to access view.

For machines that may leverage MiWorkspace components but are supported by Unit or Research IT, machines would likely live in OUs managed by those IT staff and could follow whatever naming convention those IT staff choose.

2. Remote Desktop Protocol

**Priority:** Must Have

**Details:**
MiWorkspace Windows computers disable RDP access by default. There is an exception policy in place for enabling RDP where appropriate. Further refining this policy and developing workflow and criteria for handling exceptions would be a good enhancement to add to the Academic Redesign effort.

3. Alternative Approach to Self-Serve Discovery Tool for Faculty

**Priority:** Mitigate with Alternate Approach

**Details:**
We feel that it is important for customers or their delegates to run the discovery tool. Faculty are considered “VIP” customers. In many instances the support team has run the tools on the behalf of VIPs.

Automating the deployment of the tool only handles one of the three uses of the tool. These uses are:

- Gathering hardware details and installed software information per migrating machine.
- Gathering use of sensitive data information per migrating user.
- Gathering end user input about system configurations and software that are important to the end user.

In order to minimize user impact during migration, we have found that merging per user feedback, Unit level knowledge, and existing workstation configuration provides us the best combination of data to define what use cases need to be covered for the user, what policies to apply and what software to install. This seems particularly important for users who are fairly unmanaged or who may have relatively frequently shifting needs.

In previous units, to address the particular concern raised in this item, we have worked with Unit IT staff, and staff lists to leverage email, personal visits, and having people with knowledge of the user’s needs run the tool.

During the academic pilots, we intend to seek direct faculty feedback regarding the tool usability. We expect to receive feedback that drive significant changes to the tool’s user

Priority: Mitigate with Alternate Approach

Details: We detail issues and challenges below, but suggest that the best approach may be to rethink our roll out strategy. For example, if we only migrate faculty when their hardware replacement cycle is up, then we have a natural backup (the old machine), and needn’t invest in complex data backup strategies.

Swapping hard drives during migration brings a number of challenges and is a costly endeavor. Some issues include:

- Needing to invest in hardware certification for most migration staff.
- Raw cost of purchasing replacement hard drives of various sizes and types.
- Risks of choosing to repurpose old hard drives.
- Time added per machine build.
- Support costs of tracking hard drives and the process changes and additions needed to support this approach.

Developing a solution that involves imaging existing drives has similar issues, especially in time added per build and the impact to the number of nightly builds that can be scheduled with existing migration staff.

After weighing the issues we will need to understand if it is better to put in time up front with users (potentially side-by-side), or to accept the cost of investing in solutions that remove the need for pre-migration user (or user delegate) involvement.

This had been a concern for multiple units to date. Depending on the unit and situation, we mitigated the issue when we:

- Worked with Unit IT, and relied on their knowledge, to proactively pull known data off of machines.
- Communicated with users to clearly explain where items should go for backup.
- Provided additional backups (either by MiWorkspace or Unit IT staff or both) for select users.

5. Administrative Access to Network File Shares

Priority: No change

Details: MiWorkspace provides a support model that, by definition, moves file share management responsibilities from Unit IT to the MiWorkspace service. Meeting the required response time and flexibility standards of support in academic units is a requirement of the MiWorkspace service. Unit IT should not have regular responsibility in this area.
The exception to this is in cases where Unit or Research IT staff leverage components of the service to deliver machines to users that they are responsible for supporting. In these cases, those IT staff should have this access and that access will be managed in the ways described in the recommendation.

It is also important to consider the security implications of implementing such a recommendation. Current access is very closely managed to assure data integrity and security. Expanding the number of administrators beyond the MiWorkspace support structure compromises this assurance. IIA will be consulted to provide guidance on determining the most appropriate way to manage administrative access to departmental and home shares.

We will continue with our current strategy, but use lessons learned from the Academic pilots to refine our approach.

6. Administrative Access to Workstations by Unit IT
Priority: No Change to Existing Approach
Details: MiWorkspace provides a support model that, by definition, moves computing support responsibilities from Unit IT to the MiWorkspace service. Meeting the required response time and flexibility standards of support in academic units is a requirement of the MiWorkspace service. Unit IT should not have regular responsibility in this area.

Access is very closely managed to assure data integrity and security. Expanding the number of administrators beyond the MiWorkspace support structure compromises this assurance.

7. Administrative Access to Workstations by End Users
Priority: No Change to Existing Approach
Details: There is an existing process in place for granting admin access to end users. The process heavily relies on what Units decide is appropriate for their users.

In researching this topic, the only sources we discovered for best practices in having separate accounts were in Windows XP or in cases where User Account Control is disabled. Further, we have worked with IIA to define best practices for this and, in supporting the service, have assumed any risks associated with this decision.

8. Administrative Access to Active Directory
Priority: Mitigate with Alternate Approach
Details: Some level of higher level access will be provided as part of our Shared Administration capability.
It is expected that the majority of machines in Academic units will not require use of a shared administration model. In the cases that do, for example - some research lab support, simply granting access to Active Directory OUs is an incomplete solution. Getting this right will require a significant design effort. We need to start with a high level approach to understand how the various use cases differ from the current MiWorkspace solution and who will provide the support to meet the higher support needs. We should then define additional capabilities (like enabling iterative trial and error troubleshooting of GPOs) that may be required to meet these needs. That discussion should drive what portions of the service should have delegated access and how that delegation should be provisioned (through processes around enhanced AD access, SCCM access, or perhaps various scripts that enable what is needed without broad access delegation).

9. Shared-Use Active Directory and Admin Accounts
Priority: Must Have (Done)
Details: The MiWorkspace Windows environment currently supports users logging in with shared use accounts. We have also granted shared use accounts admin access to machines in the past. Today, we rely on unit defined accounts and do not provision new MiWorkspace accounts for this purpose. This process will be further refined through the Academic pilots.

10. MiWorkspace Windows Virtual Machines
Priority: Prioritize After Pilots
Details: Every migrated unit containing Macs to date has had a fairly extensive use of local Windows VMs. In most cases this was to provide access to a small number of Windows applications. In nearly every instance that need disappeared with the use of MiApps.

We know this is work that needs to be done. Before giving this a priority, we would like to better understand the use cases for local Windows VMs and understand which would not be met by MiApps. We expect to gain that understanding through the academic pilots.

11. MiWorkspace Windows Virtual Machines ‘One-Click’ Deployment
Priority: Nice to Have
Details: General VM support is addressed in Recommendation 10. Developing a ‘one-click install’ of a full VM environment is non-trivial. We will review and determine the optimal approach for VM deployments as part of the Academic pilots.

12. Means to Deliver MiWorkspace Features and Services to non-SCCM Machines
Priority: Must Have
Details:
It is expected that the majority of machines in Academic units will support the MiWorkspace image and full suite of MiWorkspace capabilities. We recognize that there is a need to support machines which cannot be reimaged with the MiWorkspace build. We consider this one of the primary use cases driving our BYOD design.

13. Limit Significant Changes During an Academic Semester to the PC Computing Service if They Negatively Impact Teaching and Learning
Priority: Must Have

Details:
A freeze approach, that considers the academic calendar, will be developed for all of MiWorkspace’s infrastructure.

14. MiWorkspace Support for Older Operating System Versions
Priority: Prioritize After Pilots

Details:
Refining what ‘basic support’ means for older OSes will be part of our Academic pilot work. It is already the case that MiWorkspace supports legacy systems after migration. The focus for the pilots will be to determine if technical capabilities need to be added to the service to ease this management.

15. Alternate Windows Settings Cannot Be Customized by Users
Priority: Must Have (Done)

Details:
As MiWorkspace runs into configurations that deviate from the ‘standard build’, we analyze the security and support impacts of making changes to meet those needs. Once we decide to move forward with making a change, we either change the ‘standard build’ to accommodate the new requirement, or (most often) implement a standard method for supporting that type of case moving forward. These methods are not limited to just GPOs.

16. Dual Boot Machines
Priority: Prioritize After Pilots

Details:
There are a number of use cases for dual boot machines. As part of the Academic pilots, we plan to define the scope for and validate these cases. We want to ensure that dual booting is the most appropriate solution for each case. We will also work to understand what percentage of the population falls into the category of needing dual booting. We will use this information to assign the appropriate priority to this enhancement.
17. Zero-Client Virtual Desktops
Priority: Prioritize After Pilots
Details: We suspect that this recommendation impacts a small percentage of campus users, but hope to learn more about the specific case and need during the Academic pilots. It is likely that any enhancement that are developed to meet this recommendations will come as part of the MiWorkspace BYOD effort.

18. Imaging Service
Priority: Nice to Have
Details: The value of this capability is clear. Implementation will require fairly extensive design and analysis. We feel it is not required to deliver MiWorkspace for campus, but a very nice to have. We are adding this to our enhancements list with a low priority.

C. MiWorkspace Macs

1. Access to Storage Resources Like AFS or NFS from a Mac Configured for Non-Uniqnames
Priority: Must Have
Details: This requirement can be met by isolating a group of UID numbers that PT server will not assign to uniqname accounts which are in turn used to populate the UID field of non-uniqname AD accounts that may login to a MiWorkspace computer. MiWorkspace Mac clients will then be configured to use only directory assigned UIDs.

This requirement will necessitate effort from the following teams: MCommunity, PT Server, Active Directory, MiWorkspace

MCommunity has agreed to lead the development process of a directory based solution for this issue. The conceptual approach is as follows:

○ A block of UID numbers is reserved for this process insuring that PT server will not give them out to uniqname accounts in the future.
○ MCommunity will hold that that number block and be the authoritative service for assigning them.
○ All AD accounts needing a UID assignment will be placed into a designated AD group.
○ A script will parse the AD group at a designated interval for accounts missing the UID attribute; the script will query MCommunity for the next available number and assign the attribute.
○ UID numbers will be used only once; there will be no recycling or lifecycle management of them.
MiWorkspace Macs will be configured to use directory assigned UIDs only.

2. **Active Directory Groups to Manage Access to Specific Machines**
   
   **Priority:**
   Must Have
   
   **Details:**
   MiWorkspace will meet this requirement on systems where regulated data is present and need is defined either through regulatory agency policy (e.g. ITAR) or University policy as defined by IIA. Scalability of the solution may prohibit deployment to systems where there is a want but no regulatory or UM policy need.

   Macs requiring restricted access will be configured to allow logins from only members of an Active Directory group created specifically on a per machine basis. MiWorkpsace will modify the Apple AD client plugin in order to scope login to specific group(s) in AD. The workflow for the group creation and maintenance process will likely mirror what is already in place today for delegated admin access to MiWorkspace Windows computers.

3. **Limit Significant Changes During an Academic Semester to the PC Computing Service if They Negatively Impact Teaching and Learning**
   
   **Priority:**
   Must Have
   
   **Details:**
   MiWorkspace already meets this requirement with regard to the Izzy deployment infrastructure and conditionally with client endpoints.

   Currently, MiWorkspace does not make large scale changes to the Izzy infrastructure at the beginning of each academic term to insure stability and availability. However, routine maintenance such as minor dot revisions to deployed software continue as normal (examples: Acrobat 11.2 → 11.3 or iTunes 11.0.4 → 11.0.5). This method of operation has been in place for the LSA and SITES teaching and learning environments and has proved to be a successful strategy. MiWorkspace believes an unconditional “freeze” period for most client computers is an outdated method of operation in today’s environment. Incremental vendor updates are common place today and are often desirable to deploy widely for increased functionality and security while having little impact on UI or how users interact with the software. Apple’s implementation of XProtect means that all Macs (in or out of MiWorkspace) are subject blacklist of any title Apple deems a threat to their platform without warning. MiWorkspace must reserve the right to update affected software or lose access to it completely which would be a larger disruption to teaching and learning than any incremental update. The advent of the Apple App Store also increases pressure for the teaching and learning environment to stay current since many users will update titles on their own via sources like the App Store and expect full compatibility with campus resources.

   Updates that fall out of scope of the process described above would be major software revisions (example: Photoshop CS 5 → Photoshop CS6 or OS 10.8 → 10.9). These updates often bring significant changes to UI and/or compatibility would only be deployed to teaching and learning environments between academic terms after extensive testing and appropriate communication.
D. MiWorkspace Storage

1. Access to a Universal Home Drive Space
   Priority: Must Have
   Details: The MiWorkspace and Storage teams recognize the directory challenges presented to faculty and staff with multiple appointments. We agree a universal home directory for all staff and faculty, regardless of number of appointments, would be a good solution.

   The requirements will be gathered based on the understanding of the entire business process. After the business requirements are defined, the technical evaluation and design will follow. Once the design has been completed and vetted, a development and implementation plan will be defined and target date for availability will be announced.

   At this time, an anticipated availability date can not be projected.

2. HIPAA, ITAR, FERPA Requirements for Storage
   Priority: Must Have (Done)
   Details: The storage utilized by MiWorkspace has been evaluated by the Information and Infrastructure Assurance team and determined it meets the HIPAA, ITAR and FERPA compliance requirements.

   The “Sensitive Data Guide to IT Service” (http://www.safecomputing.umich.edu/dataguide/) is an information technology compliance checker maintained by IIA. Protected health information, student education records as well as export controlled research are data types supported by MiWorkspace services.

   As part of the Central Administration MiWorkspace roll-out, University Health Services and Office of the Registrar were among the units to move to MiWorkspace successfully.

3. VPN Access to MiWorkspace Storage
   Priority: Must Have (Done)
   Details: Remote access from work and personal computers, is available today as part of the standard MiWorkspace delivery. Direct and secure access is part of the standard installation of MiWorkspace for Window users. For Mac users, VPN access can be set up by contacting the Help Desk.

E. MiWorkspace Network

1. Scope of ITCOM Networking Services
Priority:
Out of MiWS scope

Details:
ITS Comm agrees with the steering committee on the need and demand for a comprehensive In-Building Network service as described above. ITS Comm is currently assessing the impact of a comprehensive In-Building Network service on existing ITS Comm services and the changes necessary to those services. Additionally, one of the prerequisites to delivering such a service is a financial model that will not only encompass the costs incurred for providing the service, but also do so in a fair and efficient manner. As part of the discussions with ITS Finance regarding the financial model for this comprehensive service, ITS Comm is working with the following constraints/requirements in mind:

- Provide a unified In-Building Network service that includes both wired and wireless connectivity
- Ensure that cross-subsidies are kept as low as possible, if not eliminated entirely
- Ensure that the service includes activities such as equipment replacement/upgrades, technical consultation, technical expertise and recommendations in addition to the support and maintenance of the existing infrastructure

2. VLAN/DHCP Issues
Priority:
Must Have (Done)

Details:
As part of a unit’s migration to MiWorkspace, the project team performs discovery and analysis on the unit’s network and network configuration. Part of this process includes working with the unit to develop a plan to transition their network to a state that is most conducive for the deployment and usage of MiWorkspace workstations. One of the “standard” configuration items that is assessed/applied to a unit’s network is ensuring that the network is configured for DHCP and the DHCP settings are configured to allow assignment of IP addresses with the need for a MAC address to be previously registered with the DHCP server. If a unit’s network does not have this configuration already, then the project team works with the unit to ensure that their network is configured in this manner. Sometimes, this is an easy conversation with the unit and other times it takes some amount of convincing. The conversation not only includes technical topics, but also those of business requirements and processes that drove the implementation of solutions that restrict IP address assignment.

3. Maintenance and Upgrade Schedules for Switch OS
Priority:
Must Have

Details:
ITS Comm continues to take steps towards maturing this capability. Unfortunately, we are not at the maturity level we would like with this capability. The overall goal is to develop processes that will allow ITS Comm to properly identify, test, assess, schedule and perform network maintenance. The processes under development are not meant to eliminate unit engagement and approval for upcoming maintenance work, but rather to bake that step into those activities.
We are also striving to gain a better understanding of the unique constraints and business needs of each unit and will start taking those into account when performing maintenance work. However, as units undergo a transformation in terms of in-house technical expertise, ITS Comm recognizes that it will need to adjust its messages to ensure that they are meaningful to a changing audience. Work is being done in this area to clearly communicate the intent, purpose and end-user impact of any service affecting activities.

4. **Wireless**  
**Priority:**  
Out of MiWS scope

**Details:**  
The current model for Wi-Fi deployments on campus relies on units to fund Wi-Fi deployments. This has led to a situation similar to wired networking on campus with large disparities in the quantity and quality of Wi-Fi networks across units. In response to demands from students, faculty and staff to ensure adequate Wi-Fi access across campus, ITS Comm proposed, received funding for and implemented enhanced Wi-Fi capabilities in Shapiro and Hatcher libraries. Additionally, funding was requested and recently approved for ensuring ubiquitous Wi-Fi coverage in public use buildings such as Michigan Union, Michigan League, Pierpont Commons, Palmer Commons and Rackham. ITS Comm is also working on a larger capital request to provide pervasive Wi-Fi coverage to a majority of campus buildings. However, the scope and exact details of the request are still very much in flux and no definite information, including anticipated deployment timeline, is available at this time. ITS Comm is always open to working with members of the academic community to find ways to ensure that adequate and appropriate technology is available in all spaces.

F. **Software and Software Lifecycle Management**

1. **Discovery Tool and Implementation**  
**Priority:**  
Must Have (Done)

**Details:**  
The Discovery process leverages information gathered from Unit IT, machine audits and submitted end user feedback to make software migration decisions. All data is presented to Unit IT to make per machine software configuration decisions. The Discovery process will be re-validated during the academic pilots.

2. **User Requests for Software**  
**Priority:**  
Must Have (Done)

**Details:**  
As part of MiWorkspace’s move into a unit, escalation and approval paths are defined for software & hardware changes and orders. The process can vary unit to unit. Neighborhood IT manages coordinating this activity.

3. **Review Software Profile and Pathway to Software Rationalization**
Priority:
Must Have (Done)

Details:
The recommendations and charge in this recommendation are already the standard operating procedure for MiWorkspace discovery and implementation. This activity will be further refined as we work through the Academic pilots.

4. Updates for Lab Installation (Class Labs/Computer Classrooms, Open Labs)
Priority:
Must Have

Details:
The project expects to leverage existing Sites capabilities as part of Computer Classroom and Open Lab support. Sites currently offers expedited software installs for a fee. This approach will be further refined and integrated during the Academic pilots.

5. ITAM
Priority:
Must Have (Done)

Details:
MiWorkspace currently deploys applications for ITAM customers. Units continue to manage their relationship with ITAM and MiWorkspace handles packaging and installs of software. Further, a project is being proposed to better integrate and support IT Asset Management in MiWorkspace.

6. Ability to Turn Off Forced Software Updates
Priority:
Must Have

Details:
This capability will be available and definable on a case by case basis as part of our migration to SCCM 2012 in September.

G. MiWorkspace Hardware

1. MiWorkspace Equipment Loans
Priority:
Must Have

Details:
The current hardware pool used to address break/fix issues either to replace a failed device or provide a short term loan while the failed device is repaired has come from existing unit stock. We can refine the current service to accommodate intermediate to long term loans.

We have also been able to accommodate short term computer loans for both individual and event requests. The pool of hardware used to accommodate these requests has come from
either existing unit stock or unit hardware that was replaced during migration and is also capable of supporting the MiWorkspace image. For example, we are fulfilling a request by Housing to provide 38 laptops to support student move-in over a 3 week period in August/September. We leveraged older laptops that were replaced during Housing's migration combined with Housing's existing loaner pool and further supplemented by a handful of laptops that were replaced during other unit's migrations. We know that this will likely be an annual request and will be retaining this hardware to fulfill this and other requests throughout the year.

Our overall strategy is to leverage older but still imageable hardware that was replaced during a unit's migration as the seeds for our loaner pool. We will refresh this loaner pool as unit's replace hardware throughout the year.

A potential complication with this requirement has to do with sponsored research, which requires a different cost recovery method. As a public good service we have to guard against unintended subsidies. Sponsored research is expected to pay for services that are not included in the basic university overhead calculation automatically included in each grant.

In order to meet the needs of faculty as described, the existing loaner pool will need to be expanded to include more current/new models. For the pilots, we could possibly leverage existing unit stock to accommodate these needs, and over time be able to put data around the actual need and usage of this equipment pool. This will allow us to gauge the demand/value of the offering and to right size the loaner pool both in terms of quantity and mix of computers required.

2. **MiWorkspace Purchasing Assistance (a)**  
**Priority:** Must Have (Done)

**Details:**  
The current process that the Depot follows when placing an order on behalf of the unit is to include both the requester and authorized signer (who is presumed to be the budgetary authority) on order to confirm its completeness and correctness prior to proceeding with the order. This would appear to link the service, the requester and budgetary authority at the point of purchase. This process will be refined over the upcoming months as we develop ServiceLink workflow to better support automation of approvals and ordering. This will allow the Depot to focus staff hours on consulting about proper models to use rather than operational transactions.

As we engage in discovery with units we always review our current process, and make adjustments to better align with unit needs.

3. **MiWorkspace Purchasing Assistance (b)**  
**Priority:** Must Have

**Details:**  
We can refine and enhance our approach during unit discovery to understand faculty needs for computers in teaching and research. Our production support environment is maturing and evolving and can be refined to develop a mechanism to discuss and take action on evolving
The current process that the Depot follows when placing an order on behalf of the unit is to include both the requester and authorized signer (who is presumed to be the budgetary authority) on order to confirm its completeness and correctness prior to proceeding with the order. While this links the service, the requester and budgetary authority at the point of purchase, it does little to provide “consulting” to help the customer choose the right hardware to fit the need. The purchasing process will refine over the upcoming months as we develop ServiceLink workflow to better support automation of approvals and ordering. This will allow the Depot to focus staff hours on consulting about proper models to use rather than operational transactions.

Additionally, we will continue to leverage current processes to evaluate non-standard hardware for support within the MiWorkspace service. When, during discovery, we encounter a hardware model that is not currently supported by the service we make a determination whether or not to evaluate that model for imaging (we will support models regardless of whether or not they can be moved to MiWorkspace technologies). Some decision factors around evaluating a model are quantity of the model currently deployed in the unit, the likelihood of encountering a similar model in other units, the age of the model, and whether the model is from a current or former strategic partner of the University. The evaluation includes borrowing a computer from the unit, attempting to package drivers, and then performing production readiness testing (PRT) with the MiWorkspace image. Models that successfully pass PRT are then added to the supported hardware list for MiWorkspace.

Not all hardware models are able to be imaged (e.g. non-64 bit processors, incompatible drivers, etc.) and not all use cases can support modern operating systems (e.g. - data acquisition or controller applications). For devices that we are unable to image, the unit has the option of MiWorkspace continuing to support that device (on a best effort basis) until it is ready to be replaced, at which time we will work with the unit to find a suitable replacement.

As we learn more about individual faculty needs, it is our intention to share that information with Purchasing to build a strong partnership on behalf of the campus community.

4. MiWorkspace Purchasing Assistance (c)
Priority: Must Have (Done)

Details:
We acknowledge that the need for non-standard equipment does and always will exist for faculty, researchers, and administrative users, this is already accommodated in the current service offering.

The current process that the Depot follows when placing an order on behalf of the unit is to include both the requester and authorized signer (who is presumed to be the budgetary authority) on order to confirm its completeness and correctness prior to proceeding with the order. While this links the service, the requester and budgetary authority at the point of purchase, it does little to provide “consulting” to help the customer choose the right hardware to fit the need. The purchasing process will refine over the upcoming months as we develop
ServiceLink workflow to better support automation of approvals and ordering. This will allow the Depot to focus staff hours on consulting about proper models to use rather than operational transactions.

Additionally, we will continue to leverage current processes to evaluate non-standard hardware for support within the MiWorkspace service. When, during discovery, we encounter a hardware model that is not currently supported by the service we make a determination whether or not to evaluate that model for imaging (we will support models regardless of whether or not they can be moved to MiWorkspace technologies). Some decision factors around evaluating a model are quantity of the model currently deployed in the unit, the likelihood of encountering a similar model in other units, the age of the model, and whether the model is from a current or former strategic partner of the University. The evaluation includes borrowing a computer from the unit, attempting to package drivers, and then performing production readiness testing (PRT) with the MiWorkspace image. Models that successfully pass PRT are then added to the supported hardware list for MiWorkspace.

Not all hardware models are able to be imaged (e.g. non-64 bit processors, incompatible drivers, etc.) and not all use cases can support modern operating systems (e.g. - data acquisition or controller applications). For devices that we are unable to image, the unit has the option of MiWorkspace continuing to support that device (on a best effort basis) until it is ready to be replaced, at which time we will work with the unit to find a suitable replacement.

As we learn more about individual faculty needs, it is our intention to share that information with Purchasing to build a strong partnership on behalf of the campus community.

5. Tracking non-MiWorkspace Hardware in ServiceLink
   Priority: Out of MiWorkspace Scope
   Details: This is really a requirement for the ServiceLink project. We have passed this requirement over to that team for handling.

6. Hardware Inventory System Does Not Track Important Departmental Purchasing Data
   Priority: Out of MiWorkspace Scope
   Details: This is really a requirement for the ServiceLink project. We have passed this requirement over to that team for handling.

7. Leverage Knowledge to Improve Purchasing Power
   Priority: Nice to Have
   Details: It is the intent of the MiWorkspace Depot to have a strong partnership with U-M Purchasing. It is the strategy intent of the service to serve as the aggregator of hardware needs and demand
and, in partnership with procurement, to drive a consolidated view of purchasing power. As units migrate into the service and we have inventory information and begin managing the lifecycle of unit hardware, the Depot will be able to synchronize purchasing cycles and maximize the purchasing power of the University with our strategic vendors. Where we can achieve common standards for hardware configurations we increase our purchasing power. To this end we have established MiWorkspace technology packages that are designed to meet the majority (e.g. 80%+) of needs. We have also been working with HP and Purchasing to provide data on the previous year's HP purchases to help focus the discussion about model and configuration changes in the upcoming year, again with the goal of maximizing our purchasing power.

H. MiServer / MiDatabase

1. **Inherent Bundling of MiServer / MiDatabase with MiWorkspace**
   **Priority:**
   No Change to Existing Approach

   **Details:**
   De-coupling the MiServer / MiDatabase process from the MiWorkspace discovery discussion could impact the business case. During the discovery process, the customer lays out the optimal timing for their MiServer / MiDatabase implementation. Depending on the customer, the MiServer / MiDatabase implementation can occur before (in some cases), during or after their MiWorkspace migration. Also, during the discovery process, some of the customer’s servers or databases will be retired so again this timing is most beneficial.

2. **Response Times for MiServer / MiDatabase**
   **Priority:**
   No Change to Existing Approach

   **Details:**
   There are many details that need to be considered and worked with when migrating systems. These details often include time constraints such as scheduled maintenance and customer schedules. As a result, migrations can and often do take more time than most groups would prefer. Early adopters sometimes experience lengthier time frames as a result of the level of maturity of the service. With this context, it is presumed that the basic provisioning of the servers and databases are not what was felt to take ‘an extraordinarily long time’ but rather the full migration to the new services. With many groups already migrated through the MiServer / MiDatabase implementation, the process has been optimized and is much smoother with few delays.

3. **Speed of Deploying / Supporting New Versions of Server Operating Systems**
   **Priority:**
   Must Have

   **Details:**
   It is agreed that this is a high priority and that ITS needs to respond more quickly to releases of new operating systems

In the Service Level Expectations, ITS indicates that we will evaluate a new version and, if viable,
rollout new versions within three to six months. Unfortunately, at the current time, the same resources that evaluate and test new operating systems are the same resources that are implementing new customers on MiServer / MiDatabase. Current implementation of new versions is taking between nine and 12 months.

4. Inclusion of Firewall Information

Priority: Must Have (Done)

Details:
The form has been modified for port opening / firewall rules information to be added in the Comments section.

I. MiWorkspace Security

1. Firewalls

Priority: Must Have (Done)

Details:
Enforcing network segmentation through the use of firewalls began in the late 1980s. While firewalls have undergone important improvements over the years, criminals have developed methods of attack that easily circumvent firewall protections. Today network security technologies are continuing to evolve by incorporating intrusion prevention technologies that inspect network traffic in real time and block malicious traffic as it’s identified. At the University of Michigan, network attacks from the Internet have been responsible for nearly every serious security incident. To improve the security of our networks while supporting the missions of the University we have been examining next generation intrusion prevention technology which will provide better protections to both our wired and wireless users as well as University and personally owned computers. We believe the best approach involves a layered strategy where basic network protections such as those provided by an intrusion prevention system are available by default. Firewalls will continue to be offered internally within data centers.

We agree that the University of Michigan’s environment is complex and diverse, any insight and information regarding sensitive information or compliance requirements is always welcomed and helpful in developing strategies which appropriately protect our information assets. We look forward to continuing to work together on this.

Systems that are storing and processing sensitive information need to be physically protected in addition to being protected from cyber attacks. It is important that these environments be placed in data centers designed to host sensitive and mission-critical systems. These data centers use physical security means to restrict access to only authorized individuals. They also provide environmental and power safeguards which are necessary to maintain the availability of these systems. Designed into the data center networks are firewalls that can be used to provide further network security policy enforcement. In most cases, sensitive systems which are housed in closets or staff areas should be moved into the universities data center environment. In addition to the physical and cyber protections which data centers afford, disaster recovery
strategies are being developed that revolve around data centers and the sensitive systems they contain.

There may be some instances in which relocation of sensitive and mission-critical environments to appropriate data centers is too costly or impossible. In these unique situations, we will work with unit IT staff, network engineering, and others as necessary to understand the requirements and to develop solutions that are effective. We will prefer shared infrastructure to unnecessarily unique solutions.

J. MiWorkspace Roll-out: Day One User Experiences

1. Full Backup Prior to Initial Reload
   **Priority:**
   Must Have (Done)

   **Details:**
   MiWorkspace agrees that a full backup or replacement of the high-risk users’ hard drives is an optimal solution to avoid the risk of data loss. Some additional considerations include:

   1. We already have a process in place to back up users’ data. We use CrashPlan for the Central Administration computers who we identified as VIPs.
   2. Replacing the hard drive on the machines may also be a viable solution, but will include certified technicians for the Macs under warranty.
   3. We have proposed an alternate rollout strategy for faculty. The highlights are: rely on opt in for faculty during initial rollout. The remainder of faculty will be rolled-out on refresh or in the new BYO service.

2. Drop Off Locations for Computer Reloads
   **Priority:**
   Nice to Have (Done)

   **Details:**
   We have used this approach during pilots in certain areas. The issue created by this approach resulted in extended wait times. When we attempted a scheduled pickup, we found the logistics to be difficult to unworkable.

   Working with Senior Unit leadership has proven to be the most effective means of gaining access to locations requiring additional security consideration (such as UMMA). We’ve also employed alternate scheduling tactics, doing builds during or near working hours. We would employ the drop off scenario as an alternate approach if needed for certain areas or as a makeup strategy.

3. Involvement of Desktop Support Staff in “Day 1” activities
   **Priority:**
   Must Have (Done)

   **Details:**
   We currently use job shadowing and formal training to acclimate Neighborhood IT for Day 1
activity and the reverse. We also have a program of cross training for Neighborhood IT to be able to participate in Day 1 and initial support for other neighborhoods.

4. **More Flexible Approach to Scheduling**

   **Priority:**
   Must Have (Done)

   **Details:**
   The deployment team generates a formal “punch list” that is tracked first by the field implementation team and later by Neighborhood IT to handle customer migration that did not occur - for any reason - during the initial rollout.

   Success in Central admin is measured by 95% of the population migrated. Success in the academic units will be measured as 75% of staff and 35% of faculty migrated at service maturity (end of calendar 2015).

5. **Option to Defer Reload Until Computer Replacement**

   **Priority:**
   Must Have

   **Details:**
   This recommendation has been made to program governance. We will learn more about the intricacies of this option during our upcoming pilots.

6. **Password Syncing Campaign**

   **Priority:**
   Out of MiWorkspace Scope

   **Details:**
   This is a precursor activity for MiWorkspace. The MCommunity team chose to align timing with MiWorkspace to leverage the field support and change management activities.

   MiWorkspace would be glad to have passwords synced at any time before rollout. Conversely, we are glad to continue to align timing if the MCommunity team wishes to continue to leverage MiWorkspace field support and change management. This recommendation has been turned over to the MCommunity team leadership.

7. **Option for Role-Based Deployment Scheduling**

   **Priority:**
   Nice to Have (Done)

   **Details:**
   This recommendation is supported by the decoupling of Faculty from the general rollout that MiWorkspace has recommended to program governance.

   We will learn more during the pilots. This approach has implications to the network, storage and printer migrations so dependencies still need to be mapped.
K. MiWorkspace Discovery Process

1. Pre-Workforce Transition / Pre-Discovery Information Gathering
   Priority: Must Have
   Details: MiWorkspace agrees that Academic and Research units as well as MiWorkspace would benefit from earlier information gathering efforts. This will be particularly true in areas such as networking, storage and server administration.

   We will share the technical and operational discovery templates and all updates to the templates with the units to help with planning.

   Further, to help units tune their analyses, identify common needs, and find synergies, we meet with unit leadership and share experiences from other units during those meetings.

2. Order of Discovery and Workforce Transition
   Priority: No Change to Existing Process
   Details: Karen Sloan, Human Resources Director, addressed this in her conversation with the Steering Group on June 5, 2013.

3. Mission Specific Responsibilities and Filling Orphan Gaps
   Priority: Must Have
   Details: Miworkspace agrees that everyone will benefit from a created and shared staffing model.

   We have already employed a couple of these strategies for the central administrative unit rollout. As we progress through the pilot we’ll employ these, and likely other, strategies to assure that Michigan IT provides continuous service for our customers. The goal of this response is to demonstrate that Unit alt and ITS will work in close alignment for the benefit of the customer.

L. MiWorkspace Neighborhood IT Model

1. Information Sharing and Incident Handoff Between Neighborhood IT and Unit IT
   Priority: Must Have
   Details: We believe that the ability to exchange information about incidents, requests, etc. via ServiceLink is critical and think that Unit IT’s utilization of ServiceLink should be a requirement rather than optional as the number of units and people utilizing the service continues to
increase. Currently specific Unit IT assignment groups, with Unit IT staff as the group members, are being created in ServiceLink to accomplish this.

Regular meetings between Neighborhood IT and Unit IT should occur in the form of Neighborhood IT staff members participating in Unit IT staff meetings or by holding specific Neighborhood IT-Unit IT status meetings.

2. Transitioning From an Organizational Model to a Geographic Model
Priority: Must Have

Details: We believe it is essential in the long term that Neighborhood IT staff members be co-located in small teams to facilitate team development and knowledge sharing which are key success factors in developing depth of coverage for the MiWorkspace service. If desired, a six month period before relocating Neighborhood IT staff members is reasonable. If, however, both Neighborhood IT and the unit agree, relocation may occur before 6 months as it already has in some cases. The relocation of Neighborhood IT staff members will be evaluated with the unit as the relocation opportunities present themselves.

3. Unit Involvement in Neighborhood IT Personnel Decisions
Priority: Must Have

Details: Neighborhood IT will involve the unit in the placement/hiring process of Neighborhood IT staff members, when necessary, to clearly identify any unique culture or other support requirements. It is expected that over time Neighborhood IT support will become more team than individual oriented so that faculty and staff receiving support will likely receive support from multiple team members rather than just one individual.

The Neighborhood IT management team expects to solicit feedback from the unit on a regular basis regarding the performance of Neighborhood IT staff members as part of ITS’ ongoing work plan and annual review process. This feedback will be critical in making sure that the observations of the Neighborhood IT management team are in alignment with what the unit is seeing onsite within the unit on a day to day basis.

4. Retaining Access to Expertise
Priority: Must Have (Done)

Details: A key component of the Neighborhood IT concept is to keep desktop support staff located as close as possible to the people for which they are providing support so that the local knowledge of the department’s business process and technology are part of the service delivered. In developing the neighborhoods our intent is to have small teams familiar with the inner workings of each department while at the same time having a larger staff member resource pool (i.e. neighborhood team) that can step in and assist with standard support calls when needed.
Unless resolutions to problems have been documented in the ServiceLink knowledge base, Service Center staff are trained to escalate incidents and requests to Neighborhood IT (or Unit IT if documented accordingly) as soon as it is clear that the Service Center cannot resolve the issue.

5. **Customer Satisfaction**
   **Priority:**
   Must Have

   **Details:**
   The reporting metrics provided to units utilizing the MiWorkspace service are not fully developed and the frequency/level of detail for these reports has to be defined. Our intent is to be transparent about the level of service being provided but the reporting also has to be sustainable across all units and ITS services. Ideally, departments will have the ability to access the service data themselves so that the frequency and level of detail can be self-determined.

   The Neighborhood IT management team will develop an escalation process for unit leadership.

   Additionally, as an oversight mechanism, ITS has created a Customer Relations (CR) role and structure. The individuals on the CR team have/are creating a standing monthly meeting with representatives of Unit and Departmental senior leaders. The purpose of the interaction is to review quantitative service delivery metrics and to seek qualitative input on service fit. The service agrees that it takes both to truly understand fit for customers.

M. **MiWorkspace Manage Your Own Devices [Also known as Bring Your Own Device (BYOD)]**

At the time of this report, BYOD / MYOD is not in the current MiWorkspace scope. Recommendations have been presented to governance to charter a new project. If the new project is funded, MiWorkspace can add this workstream to the program. The responses below assume that the BYOD / MYOD project is funded.

1. **BYOD Access to the Network, Collaboration Tools, and Departmental Drives**
   MiWorkspace will organize and enhance existing ITS capabilities that meet this recommendation. In reality, there are already a number of “Bring Your Own Device” (BYOD) or, as the project team would prefer to call it “Enable Your Device”, features available to both MiWorkspace and non-MiWorkspace customers. The goal of the service is to pull these together in an easy to use “portal” and fill in the support gaps that are exposed as part of that work.

2. **Printing from Personal Mobile Devices**
   For Mobile devices, capabilities similar to those provided by MPrint already exist. For other non-Mobile BYOD devices, users can currently install the MiWorkspace print client and print to MiWorkspace printers. Both of these activities will become better documented, refined and incorporated into the BYOD bundle.

3. **BYOD Security**
   With SPG 601.33 coming out, ITS, led by staff from IIA is working to define what needs to be done to support this policy. MiWorkspace will be working with them to make sure that our BYOD efforts are aligned and that this requirement is met.
4. **BYOD Student Support**

MiWorkspace will leverage the existing Campus Computing Sites services, including Virtual Sites to meet these requirements. Potential changes to these services and changes to MiWorkspace’s discovery efforts will be identified during the Academic pilots. Bundled BYOD support, including student support, will come out of the BYOD project.

**New MiWorkspace Services**

New services were recommended from the EUC Steering Group: MiWorkspace Linux, MiWorkspace Classroom Computing, and MiWorkspace in the Research Environment. Additional information regarding what MiWorkspace will provide for each of these services is detailed below.

**A. MiWorkspace Linux**

1. No fully-managed MiWorkspace Linux Service
2. Develop easily-deployable Linux packages
3. Focus initially on design / build of eight Ubuntu Long Term Support packages
4. Fully support RedHat Enterprise Linux at the earliest reasonable opportunity
5. ITS will pick-up the RedHat Enterprise Linux service if LSA discontinues providing this service
6. Proceed with the Linux project plan as currently defined

ITS has begun a project for a campus-wide Linux service. The scope and requirements for this project incorporate the recommendations noted above.

**B. MiWorkspace Classroom Computing**

1. Focus on commodity IT services for classrooms
2. Initially pilot podium computers in 110 classrooms
3. Evaluate 210 class labs, 220 open labs, and 350 conference rooms during discovery
4. Follow technical requirements for podium computers in 110 classrooms
5. Follow technical requirements for in-room student computers in 210 and 220 labs
6. Identified individuals will have general access to podium computers in 110 classrooms using Kerberos login
7. Provide service and support to podium computers in 110 classrooms and student computers in 210 and 220 classrooms
8. During discovery, evaluate whether certain classroom support / special tasks may be orphaned and determine shared staffing opportunities
9. Provide one wired ethernet connection for 110 classrooms
10. Equip 110, 210 and 220 classrooms with robust wireless capabilities
11. Provide easy access and streamlined management of University licensed software on personal devices

ITS will begin a project in Fall 2013 for classroom computing. The scope and requirements for this project will begin with the recommendations noted above.

**C. MiWorkspace in the Research Environment**

1. Uniform first point of contact for support
2. Machine acquisition
3. Flexible load set
4. **Support for dual boot configurations**
5. **Develop a system for supporting research computers; specifically the computers controlling research data collection devices**
6. **Discovery process**
7. **Expanded hardware support**

Some of these recommendations currently exist for MiWorkspace. For the remaining recommendations, additional use case information may be required before these recommendations can be implemented. Also, feedback acquired during the Academic Unit pilots and roll-out will be learned for incorporation into the Research environment.