Leonard Huxley Data Centre Standards
11 November 2008

This document outlines the standards that are enforced within the Leonard Huxley Data Centre, and as amended from time to time. Also specified are the responsibilities of data centre users and those of data centre Facilities Management Staff. These standards are being implemented during the re-racking and installation of new equipment in the data centre. As such, not all areas of the room yet conform to these standards. These standards should be referenced by users prior to entering the Leonard Huxley Data Centre.

1 Facilities Management Staff Role

The University Officer responsible for the Leonard Huxley Data Centre facility is Head, Networks and Communications. The Head, Networks and Communications has identified Facilities Management Staff (FMS) who, in part, are responsible for the day-to-day management of the facility.

The FMS for the Leonard Huxley Data Centre are:

Geoff Barlow: 53745        Dave Hardwicke: 58397        Kylie Paintain: 55034

FMS are responsible for the following tasks.

1. Provide rack unit (RU) space to users for the installation of computer equipment.
2. Provide, install and manage facilities and support services for the computer equipment in the data centre.
3. Provide sustainable asset management of the data centre and its facilities, including the design and implementation of facilities life extension and development.
4. Manage physical access.
5. Ensure data centre users adhere to procedures and standards specified in this document.

1.1 Equipment Provided

FMS will provide data centre users with RU space within 42RU APC SX data racks. These will be fitted with power distribution units (PDUs), cable tidies, UTP patch panels, fibre optic break out trays (FOBOTS), and network management switches. The exact layout of this infrastructure will depend on the specific requirements of the user and should be discussed with FMS prior to commencing work. Table 1 details some common rack layouts.
Table 1 - Rack Communications Layout

<table>
<thead>
<tr>
<th>RU Number</th>
<th>1F, 1U</th>
<th>2F, 1U</th>
<th>3F, 1U</th>
<th>1F, 2U</th>
<th>1F, 3U</th>
<th>4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>41</td>
<td>T</td>
<td>F</td>
<td>F</td>
<td>T</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>40</td>
<td>U</td>
<td>T</td>
<td>T</td>
<td>U</td>
<td>U</td>
<td>T</td>
</tr>
<tr>
<td>39</td>
<td>T</td>
<td>U</td>
<td>F</td>
<td>T</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>38</td>
<td>MS</td>
<td>T</td>
<td>U</td>
<td>U</td>
<td>U</td>
<td>F</td>
</tr>
<tr>
<td>37</td>
<td>T</td>
<td>MS</td>
<td>T</td>
<td>MS</td>
<td>U</td>
<td>MS</td>
</tr>
<tr>
<td>36</td>
<td>T</td>
<td>MS</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>35</td>
<td>T</td>
<td></td>
<td></td>
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<td>MS</td>
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<tr>
<td>34</td>
<td></td>
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<td></td>
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<td>T</td>
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</tbody>
</table>

Where:
- F denotes a single RU 24 core SC FOBOT
- T denotes a single RU horizontal cable tidy
- U denotes a single RU 24 port cat5e UTP patch strip;
- MS denotes a single RU 48 port network management switch

Other equipment can be supplied and installed by FMS if required including:

1. Rack LCD monitor keyboard mouse
2. KVM switches
3. Rack shelves

To see examples of racks in the data centre, or to discuss specific rack requirements, please contact FMS.

2 Data Centre Access and Behaviour

2.1 Conditions of Admittance

Physical access by individuals into the data centre is based on a current, identified need which has been approved by the Delegated Authority – Head, Networks and Communications.

Individuals who require ongoing access to the data centre door should first seek endorsement from their supervisor, identifying a legitimate need for ongoing access. Once endorsed by the supervisor an application for ongoing access can be made to FMS. Once approved by Head, Networks and Communications, users will be given CARDAX access to the necessary doors.

When the ongoing access need is no longer required users should inform FMS to remove their access.

FMS will undertake periodic access audits and may request revalidation of the ongoing need for access. Any extended non-use will result in that access being
terminated (after confirmation by the FMS from the user that access is no longer required).

2.2 Data Centre Behaviour

The data centre is utilised by many groups and users must be considerate of other parties in the room. Once users have been granted access to the data centre, the following conditions must be met.

The principles underlying the use and access to the data centre are:

- Safety is paramount. All activity requires a safe access environment to be maintained.
- Security of physical infrastructure is critical for the University’s business continuity and for the security of the University’s information and information systems.
- Physical access is minimised and granted on a justifiable needs basis.
- The data centre facilities are managed as a whole. Any activity in one part of the room will affect the conditions in every other part of the room. Consequently, a single facilities management strategy applies.

Individuals entering the data centre must adhere to the following requirements and obligations:

1. No food or drink is permitted in the data centre.

2. The data centre is to be kept tidy and safe at all times. This involves adhering to the following:
   a. Any work requires a workplace safety plan to be in place, a safe workplace to be maintained, any hazards to be identified and made safe, working parties to be made conscious of hazards and to be appropriately skilled and aware, and that the work area is to be returned to normal conditions on completion of the work.
   b. Do not leave rubbish on or under the floor. Whenever possible, items should be unpacked prior to entry to the data centre. All rubbish, packing materials or unwanted parts are to be removed from the room as soon as possible. Table 2 details how different types of rubbish should be handled.
   c. Vacuum floor when necessary using power outlets labelled “No Computer Equipment”.
   d. Return all borrowed tools when work is finished or at the end of the day (whichever is sooner).
   e. Equipment such as temporary leads, monitors, laptops etc. are not to be left on the data centre floor for longer than required for the job at hand, and certainly not over night.
   f. No loose items, packaging, parts etc are to be stored in racks.
   g. Rack doors are to be secured following work or during times when rack is unattended. Racks are to remain unlocked except RackTek racks which have their keys left in the doors.
h. Spare cage nuts, bolts, Velcro ties, etc are to be placed in the appropriate boxes on the shelves inside the data centre. Any damaged nuts/bolts should be disposed of.

i. Where authority has been given by the FMS to remove floor tiles, then, the floor tiles must be replaced as soon as practicable and certainly not left open overnight. The floor tile hazard sign must be used to warn entering staff of danger. When replaced, tiles must sit flush.

j. All data centre users should exercise caution when moving in the data centre when works are being carried out, to avoid missing floor tiles and other hazards.

k. Protect your feet. Ensure your footwear is appropriate for the activity you are undertaking in the data centre.

l. Protect your ears. The data centre is a noisy environment and includes high noise spots for which hearing protection is a requirement for extended exposure to the noise. Disposable earplugs are available for users on the shelves immediately inside the data centre.

m. Protect your eyes. The lasers associated with optical fibre communication systems in the data centre present an eye safety risk. Adhere to all warnings on devices and exercise caution when working with lasers.

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Disposal Method</th>
</tr>
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<tbody>
<tr>
<td>Plastic and Foam</td>
<td>Place in hopper on level 2 loading dock. The rubbish bins in the room are for small items</td>
</tr>
<tr>
<td>Paper</td>
<td>Place in paper recycling in corridor on level 2</td>
</tr>
<tr>
<td>Cardboard</td>
<td>Place in cardboard recycling outside Nuclear Physics or Earth Sciences</td>
</tr>
<tr>
<td>Metal (including old UTP and power leads)</td>
<td>Place in box on west wall of data centre</td>
</tr>
</tbody>
</table>

3. Visitors must be accompanied by an authorised staff member.

4. The vault door is to remain shut unless there is someone inside.

5. Telephones in the data centre are available for users as required.

6. Data Centre Tours
   a. Tours should be notified at least 24 hours in advance. More notice is preferable as work requiring the removal of floor tiles or other hazards may be scheduled.
   b. Tours will only be allowed with accompanying staff. Those staff will be responsible for the behaviour of the people on the tour and for containing the group in the relevant area of the data centre.
   c. Any current work areas or safety hazards will be identified and access restricted.

7. New staff/contractor induction
   Before leaving any new staff member, contractor, or outside visitor in the data centre the following things must be explained to them.
a. Explain how the lighting works.
b. Demonstrate how to pick up and replace floor tiles.
c. Point out fire exits (loading dock, loading ramp, entrance door, south west door).
d. Point out building security, especially automatic door locking times.
e. Point out non-essential power points labeled “No Computer Equipment” (for power tools, vacuum cleaner, laptops etc.).

8. Loading dock
The loading dock is used frequently for equipment deliveries and dispatching of equipment. To ensure uninhibited access for delivery vehicles, vehicles must only be left in the loading dock area while loading or unloading equipment.

2.3 Equipment Installation and Removal
The following section details the responsibility of data centre users regarding the installation and removal of equipment in racks. All tools and parts required for equipment installation, including cage nuts/bolts, fibre fly leads, UTP fly leads, power leads etc, are located on the shelves and table against the western wall in the data centre. Users are free to help themselves to these for use in the data centre as needed.

2.3.1 Notification
Users must discuss with FMS any new work they wish to perform in the data centre. This enables FMS to organise the purchasing and preparatory work necessary to facilitate new works. Users should provide FMS with the following details.

1. Extent of footprint of work.
2. Timetable for work.
3. Expected heat density in racks initially and over the rack’s life cycle.
4. Power requirements of equipment initially and over the rack’s life cycle.
5. UTP and fibre requirements of equipment.
7. Any special requirements for installed equipment.

2.3.2 Layout of Equipment
FMS are responsible for overall room layout and configuration. Data centre users are responsible for the installation of their equipment in racks. The following points must be adhered to during the installation of equipment.

1. Equipment must be installed on RU boundaries.
2. Equipment should be installed beginning at the bottom RU. This results in more efficiently utilised space and more efficient cooling.
3. No equipment is to encroach into the area at the top of the rack behind preinstalled UTP patch strips, FOBOTs, horizontal cable tidies or management switches.
2.3.3 Power

The Leonard Huxley Data Centre has both UPS and diesel generator backup power for equipment. Three UPSs are employed to support the data centre load in the event of a power failure. In order for this UPS backup to be effective, it is important that the data centre load is balanced at the rack level. Most racks will utilise two power distribution units (PDUs), each powered by a different UPS. Each PDU provides twenty 10 amp power outlets and four 15 amp power outlets. All PDUs are monitored via FMS software. Power thresholds are in place and FMS receive notification when thresholds are breached. The successful operation of this system is dependent on the following criteria being met.

1. The shortest power lead practical is to be used for the job.  
2. Power leads are to be routed through vertical cable tidies as appropriate.  
3. The total load on a PDU must not exceed 16 amps (displayed on PDU).  
4. The total load on any bank on a PDU must not exceed 8 amps (displayed on PDU).  
5. No power is to be run from the sub floor except by FMS.  
6. No extension leads or power boards are to be used in racks or in the sub floor area.  
7. PDU’s are not to be moved between racks except by FMS.  
8. Users will not have access to the switching function on PDUs.  
9. Power leads for redundantly powered devices should be split one into each of the two PDUs in the rack.  
10. Power leads must not cross between banks on PDUs. That is, power leads from the same device will be into bank 1 on both PDUs, or bank 2 on both PDUs within a rack.

2.3.4 Cooling

FMS are responsible for the design and implementation of the air conditioning strategy within the data centre.

1. FMS will install appropriate floor tiles under racks and vents in front of racks to provide appropriate cooling of equipment.  
2. Blank off panels should be installed at the front of racks where appropriate, to prevent hot/cold air contamination. See FMS for blank off panels.  
3. Given the conventional cooling method implemented in the Leonard Huxley Data Centre, it may be necessary to distribute high heat load equipment over several racks to reduce the per rack heat density.

2.3.5 UTP and Fibre Patching

FMS will fit out racks with UTP patch strips and FOBOTs sufficient to meet the expected demand for each rack. Users will be responsible for the following;

1. The shortest patch lead practical is to be used for the job.  
2. Patch leads must be routed through horizontal and vertical cable tidies as appropriate.
3. UTP and fibre have separate horizontal cable tidies.
4. No patch leads are to be run between racks without approval from FMS.
5. No patch leads are to be run under the sub floor.
6. No patch leads other than those supplied on the shelves in the data centre are to be used in the data centre.
7. Patches are to be split evenly to the left and right into vertical cable tidies. For example, on a 24 port UTP patch strip cables should be routed as follows:
   - Ports 1-6 and 13-18 should be routed to the left.
   - Ports 7-12 and 19-24 should be routed to the right.

2.3.6 Faults
Faults within the data centre should be handled in the following way.

1. If a user believes there is a fault with a piece of data centre infrastructure, they should report it to FMS. Users should not attempt to rectify such faults themselves.
2. Any faults arising from work in the data centre should be reported to the affected party and to FMS.

2.3.7 Completion of Works
Following the completion of work performed in the data centre, users must notify FMS, who will inspect the work for compliance with these standards.

3 Facilities Audit and Change Management
The FMS will undertake a facilities audit of the data centre from time to time, and at least once per year, to review heat and power loads and their distribution within the room. Audit outcomes may include a need to upgrade, replace or rearrange facilities to maintain the whole-of-room environment. Changes requirements will be discussed with all data centre stakeholders and plans developed to effect the required changes with minimum service impact.

4 Security
Many users have a presence in the data centre and security is of utmost importance. CARDAX readers are installed on entrance doors controlling access and enabling auditing. Users should ensure that doors are closed securely when entering and leaving the data centre.

*If users have any questions regarding what is expected from them, or are unable to comply with any point detailed in this document, they should consult FMS.*