**Server Primer**

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It is important that we set up a server room that is reliable, upgradable, and has the capacity to suit the needs of the new hospital. I have put together the required equipment and hardware, as well as the design requirements for the room itself. Here is a link to a Google Drive folder which contains the PDF specifications for each piece of hardware. <https://drive.google.com/open?id=0B4GQeg073fneN1FqZmZrZ1JqcTQ>

In order to obtain reliability, there must not be a single point of failure, and we must have redundancy. For that reason, I have marked how many of each piece of equipment is required. In addition, we must hire someone to maintain the server room and keep it up to date as technology, and the demands of the hospital advance. (Note: All of the hardware names below are italicized.)

**Servers**

*Cisco UCS Smart Play 8 C240 M4 SFF Performance Plus - Xeon E5-2680v3 2.5 GH*

There shall be two of these servers. Each requires 1200 Watts of power.

**SAN Hardware**

*Cisco MDS 9710 Multilayer Director*

**Hard Drive Storage**

*Seagate Enterprise NAS ST4000VN0001 4TB 7200 RPM 128MB Cache SATA 6.0Gb/s 3.5" Internal Hard Drive Bare Drive*

We should order 30 of these 4TB Hard Drives.

**Rack**

*APC AR3100 42U NetShelter SX 600mm Wide x 1070mm Deep* *Enclosure*

Consider purchasing two of these racks so there is room to grow in the future.

**HVAC**

*Frigidaire® Through The Wall Air Conditioner 10,000 BTU FFTA1033S2 Cool Only 230/208V*

I will include two of these systems for redundancy. Each one can handle 10,000 BTUs, meaning that one could handle the room alone, should one of them fail. Each one requires 1,045 Watts. These need to be connected to the generator.

**UPS**

*SmartOnline 208/240V 10kVA 9kW Double-Conversion UPS, 6U, Extended Run, Network Card Slot, USB, DB9, Bypass Switch, NEMA*

We will need two of these in case one of them fails. This vital piece of equipment must be hooked up to the generator.

**Networking Switch**

*CISCO NEXUS 5548 SWITCH CHASSIS (N5K-C5548P-FA)*

**Hypervisor**

There must be a hypervisor set up that has the following software. VMWare, Citrix Xendesktop, and Microsoft. This will allow you to partition your servers virtually.

**Humidity Monitor**

*Grainger Data Logger, Temperature and Humidity, USB*

**Fire Prevention, Suppression, and Detection**

I included a Fire Suppression system on the Google Drive pdfs. Here is a link to the company’s website. http://www.minimax.de/en/produkte/gassysteme/mx1230novec/index.html

**Security**

No non IT personal shall be allowed in the MDF.

There shall be locks on the door(s).

A video surveillance system shall be set up in the room.

There shall be no windows, and no walls shared with the outside of the building.

**Storage Unit for Spare Parts and Tools and Cables**

Any simple non-wood cabinet will work just fine for this.

**Generator**

The AC, and UP must be connected to the generator.

**PDUs**

*4.8/5.8kW Single-Phase 200/208/240V Basic PDU, 20 Outlets (16 C13 & 4 C19), NEMA L6-30P Input, 15 ft. Cord, 1U Rack-Mount*

This will install into the rack. Two or three of these should be fine to begin with.

**Miscellaneous Details**

Things that do not belong in this room:

* Anything that burns easily: carpet, wood, packaging.
* Any Liquids at all. No coffee, or soda.
* It is a server room, not a storage room for holiday decorations, file cabinets etc.

The room should be sound-isolated from the other occupied areas. The room shall be on the first floor, shall not be carpeted, shall have no windows, and shall not have any walls shared with the outside of the building.

For easy Maintenance and Upgrading in the Future

* A color scheme for cabling could be worked out before initial installation.
* Labels shall be put on everything.

**Design**

A whole wall dedicated to AC units

A raised flooring is helpful for easy and neat cabling.

The room should have a 9ft ceiling.

There shall be a minimum of 3ft of clearance in front of, and 2ft behind the racks/cabinets.