



DICTS

Network Management Unit

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DICTS, MUK



Networks Team

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Unit services

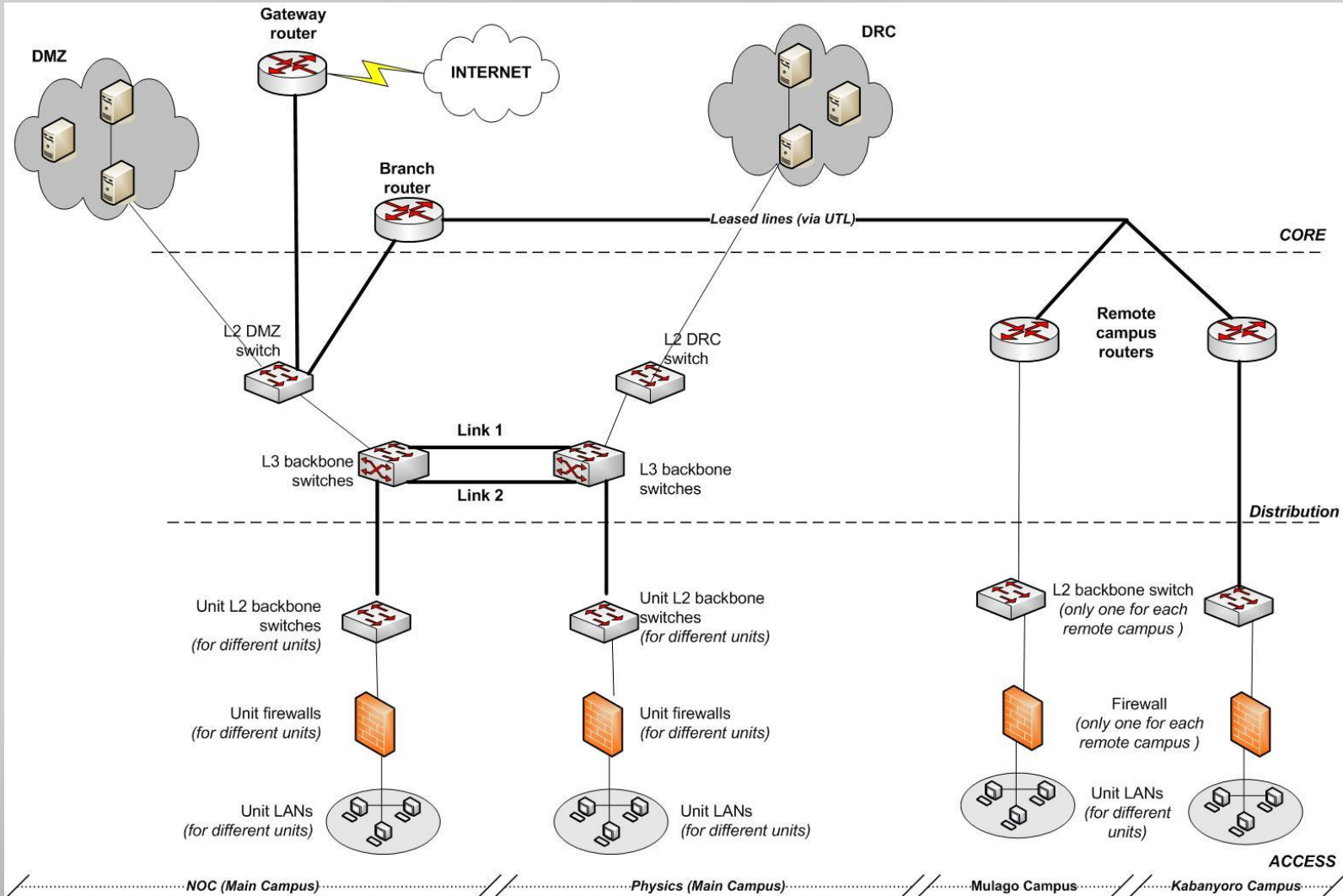
1. Network monitoring and management
2. Mail
3. Firewalls & Network Security
4. VoIP
5. Web Proxying services
6. DNS Services
7. IP Addressing
8. Wireless authentication
9. Network Innovations



Network Overview

- It has a Fiber Backbone covering over 43 units on university
- It consists of wired and wireless infrastructure
- It runs close to 15 services

Network Layout Overview





Network Services

- The network runs close to above 15 services that include the following:
 - Email Services
 - Domain Name Hosting service
 - Web hosting service
 - Voice Over I.P
 - Web proxying service
 - Enterprise antivirus
 - Open Course ware



Network Services ...

- E-Learning Service (MUELE)
- ELIN (Electronic Navigator Information Service)
- DSPACE
- Wireless
- Intranet
- Virtua
- Libis
- ITS (Intergrated Tertiary Software)



Mail Service

- This service provides the ability for sending and receiving electronic mail for the University
- It covers both the infrastructure to receive and deliver email internally and externally and the support for end users to deal with their email.
- The majority of incoming and outgoing emails are directed to the mail system, through the mail gateways
- The email gateways scan all mail for possible Spam and viruses before delivering.

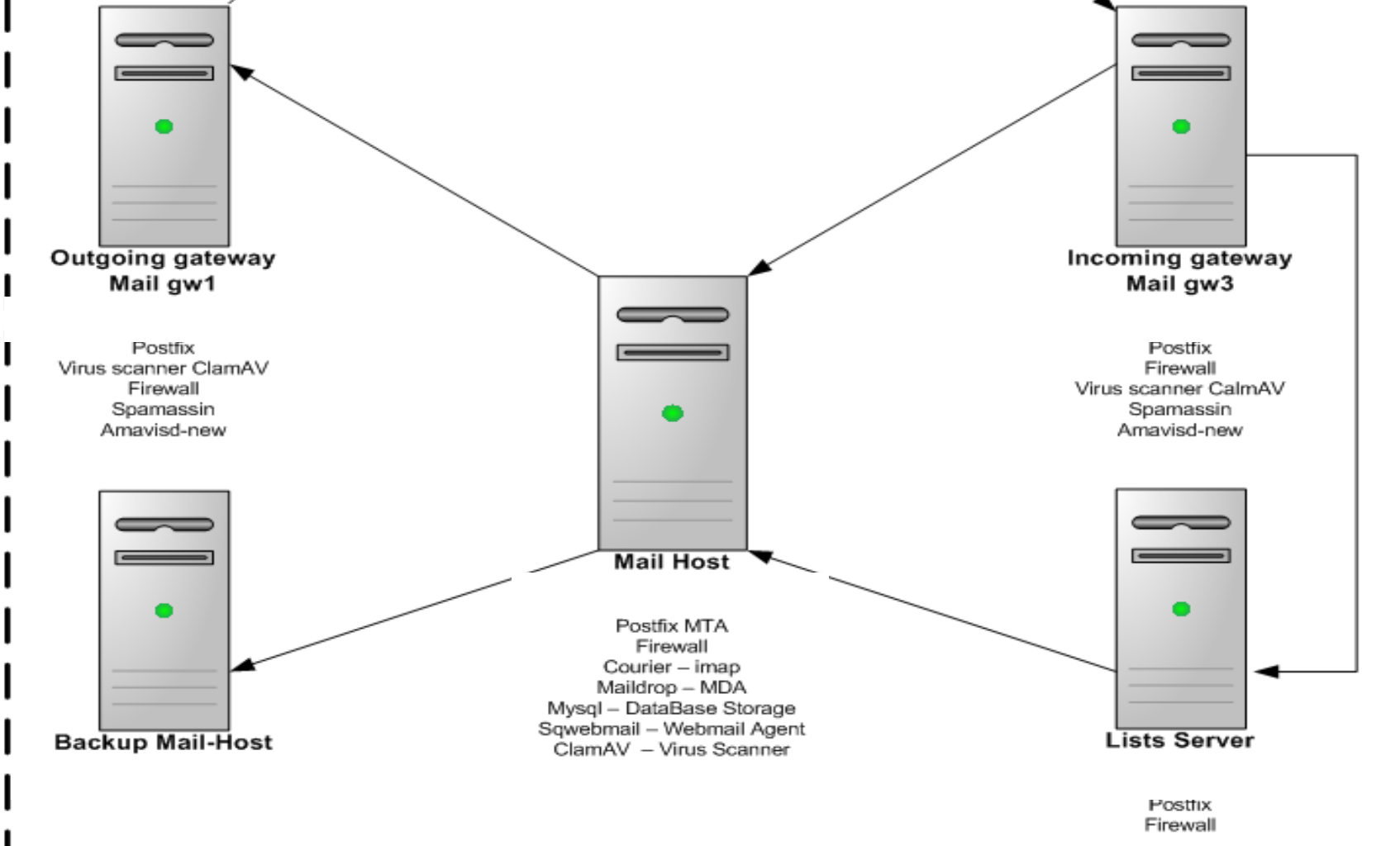


Mail ...

- Each incoming email message is allocated a Spam score and those with high rating are not delivered, those identified as likely to be Spam are tagged in the subject line to make filtering easy.
- Virus infected file attachments are removed and the mail is delivered with the subject line tagged accordingly.
- Services are also provided for the creation and maintenance of mail lists.



MAIL SERVICE





Mail Service Security

- Use of a firewall on a gateway and the gateway in a DMZ zone.
- Securing the Mail Server Operating System
- Configuration of Resource Controls
 - Done by having the right read and write access permissions of users at their various access level therefore limiting the execution privilege for most system tools
- Hardening mail server application
- Improve email Protection by the use of a spam filter

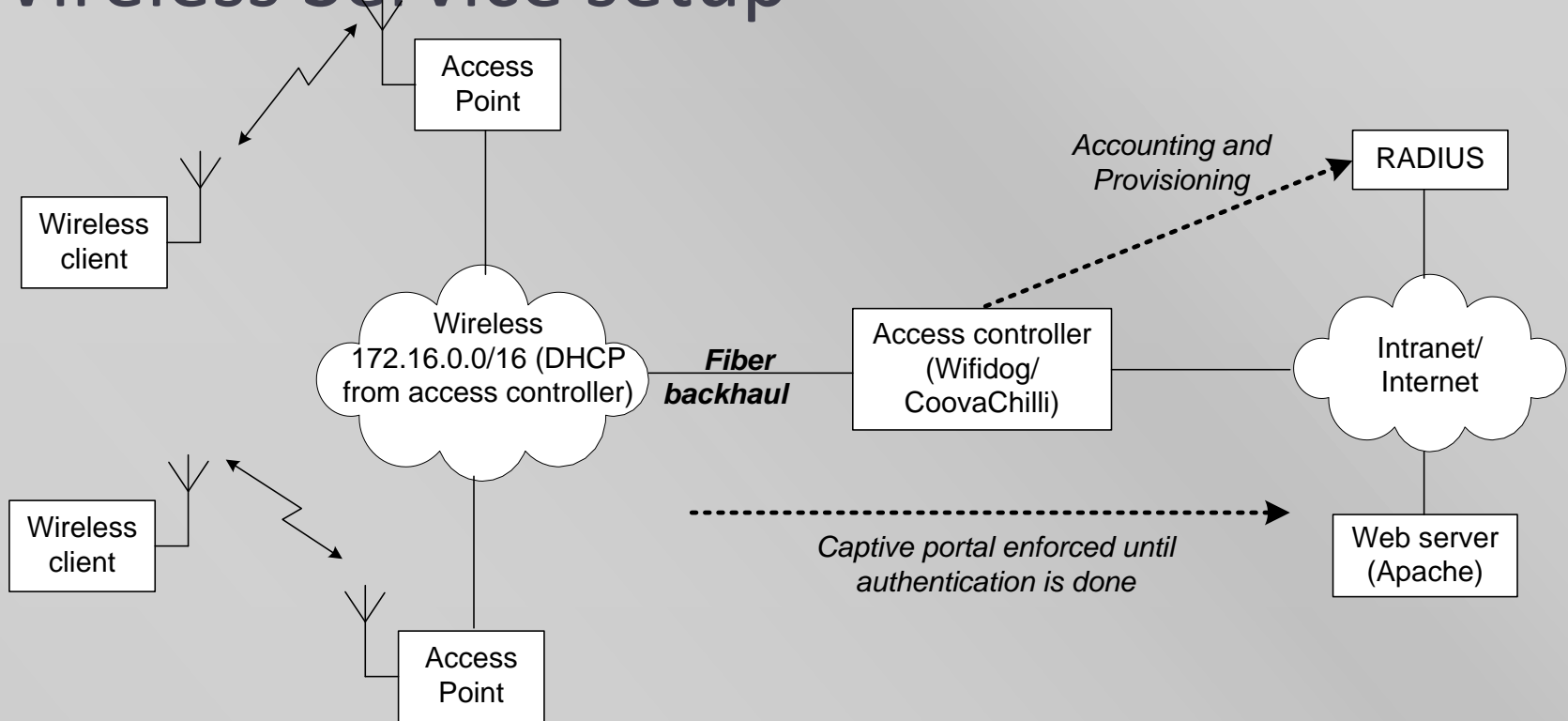


Wireless (MAKAIR)

The wireless hotspots provide students and Staff with wireless access to University network services.

The main objective was to provide students with flexible access to network services in their halls of residence and in other locations other than the computer labs.

Wireless Service setup



Our major responsibility here is Setup, Configuration, & backup
Monitoring of the wireless hotspot service is done for availability of
the access points.



Voice Over IP (VoIP)

VoIP is active for calls within the Main and Mulago Campuses and users with VoIP phones are able to communicate without going through the public switched telephone network.

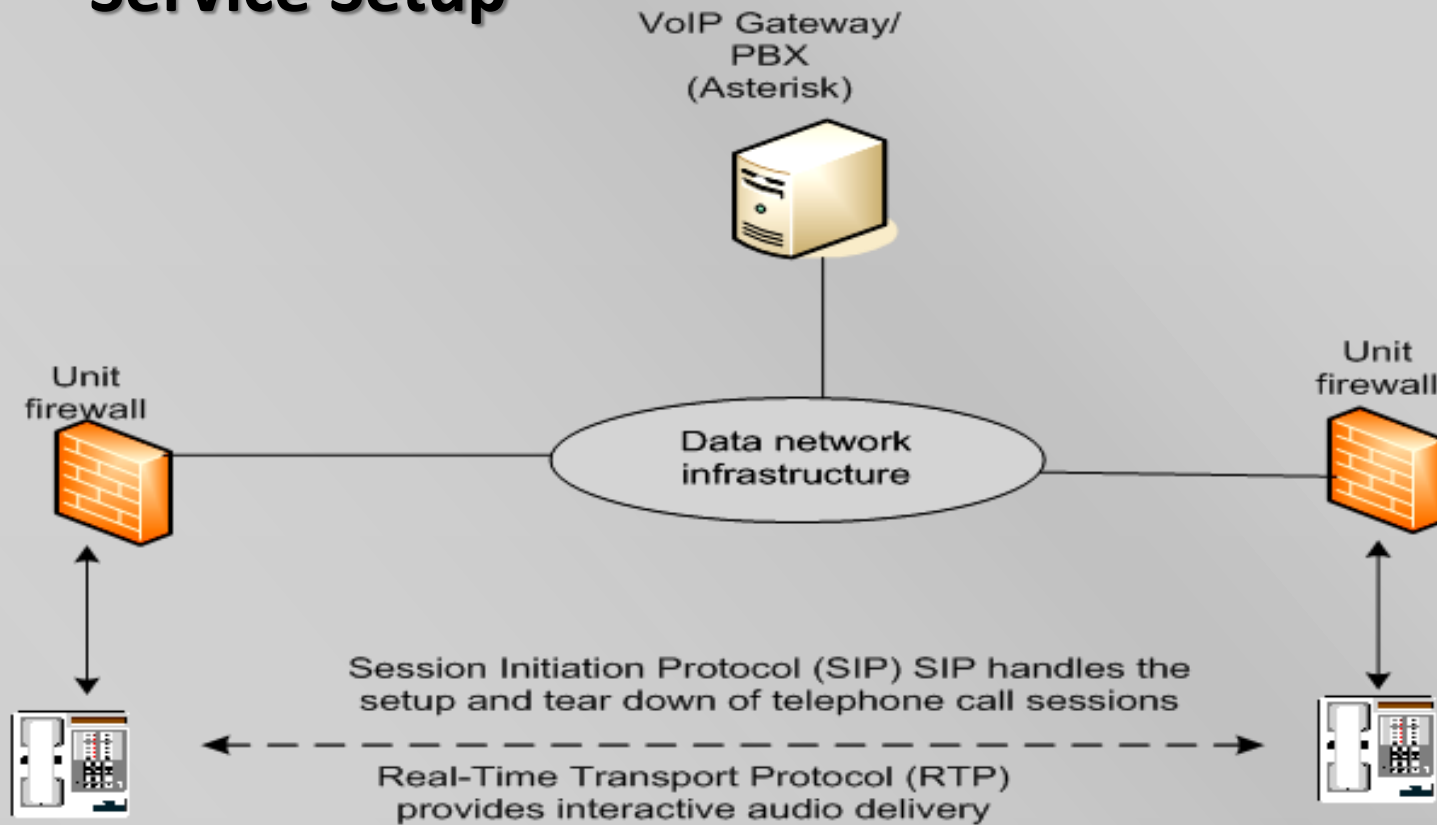
This service aims to reduce on the number of charged calls made which in turn should reduce the telephone bills and lead to call cost savings for the University.



VoIP ...

- The VoIP service provides free transmission of voice communications over the existing University data network infrastructure instead of the traditional telephone lines.
- The VoIP service exists alongside the public switched telephone service

Service Setup



- Only one network outlet is required to use a VoIP phone. When installed, the VoIP phone plugs into the network outlet and the computer plugs into the back of the phone.



VoIP tasks

- Configuration and Installation of VoIP phones.
- Setup, configuration, and backup of VoIP gateway.
- Monitoring VoIP gateway and Usage of the service.



VoIP Hard phone configuration

- To configure a VoIP phone, obtain its IP address and use it to access the configuration window via a web browser.
- To obtain the phone's IP address, press "menu" button and use the down arrow key and navigate to "status" then press "ok" (menu button).
- For new phones, you have to login to the configuration window with a default password "admin" otherwise use password as zk2070v!

Account settings

- Account name : Office name or phone user's name
- VoIP Server : voip.mak.ac.ug
- Sip user id: valid name as configured on the VoIP server
- Authenticate ID: same as above
- Authentication password : test
- Name: Same as Account name
- Voice mail User Id: user extension
- Lastly change the order of the Vocoder as below;
- Preferred Vocoder: PCMA
: PCMU
- Click update and go to advanced settings

Advanced settings

- Admin password: zk2070v!
- Phonebook XML server path: change to “Yes” and put address as :”voip.mak.ac.ug/phone “
- Ntp server : ntp.mak.ac.ug
- Click update and go to basic settings



Basic configs

- Time zone : Nairobi
- Update and reboot
- Re - logon, go to status and check if the phone registered successful



Placing calls

- Every unit/college and school has a unique code assigned to it. Phone users in the various units also have unique extensions on which they can be reached. So to make a call to a person with in the same unit, you only need to dial their extension. E.g. a user with in dicts only dials “109” (only three digits) to talk to a network admin with dicts.
- Otherwise when calling somebody from a different unit, you need to add the code 0f that particular unit followed by the extension of the particular person you would like to speak to. E.g. to call the network admin of main building basing from another unit, you have to dial “13100” (five digits).



Challenges regarding Makerere VoIP System

- User ignorance
- Laxity by systems/ network admins to ensure phones are always on and working
- Unscrupulous users who take phone adapters for their own benefit
- Phone hardware issues



Improving Unit Intranet & Internet Experience

Unit firewall Specs Report

NO:	UNIT NAME	CPU SPECS	RAM				COMMENTS
			Total	Used	Free	Cached	
1	Agric	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.80GHz cpu MHz : 2792.886	225	211	13	81	2.80GHz, 256MB 1) Ram below minimum requirement
2	Arts	vendor_id : AuthenticAMD model name : AMD Opteron(tm) Processor 244 cpu MHz : 1792.125	996	181	815	35	1.80 GHz, 1Gb 1) Weak processor
3	Chemistry	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.00GHz cpu MHz : 5984.732	234	230	4	27	6.00GHz, 256MB 1) Ram below minimum requirement
4	CHUSS (Mulago)	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 3059.053	2012	1963	49	1679	3.06GHz, 2Gb Passed
5	Dicts-Tech	vendor_id : AuthenticAMD model name : AMD Opteron(tm) Processor 242 cpu MHz : 1592.947	3953	499	3453	130	1.60 GHz, 4Gb 1) Weak processor
6	Dosate	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 1.80GHz cpu MHz : 1794.421 cache size : 256 KB	242	93	148	16	1.80GHz, 256MB 1) Ram below minimum requirement 2) Weak processor

7	Easlis	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) Dual CPU E2140 @ 1.60GHz cpu MHz : 3192.232	476	318	158	48	3.16GHz, 512MB 1) Memory upgrade required 2) Weak processor
8	Education	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) D CPU 2.80GHz cpu MHz : 5585.414	487	394	93	117	5.58GHz, 512MB 1) Memory upgrade required
9	Estates	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.66GHz cpu MHz : 2660.150	235	160	74	26	2.66GHz 256MB 1)Ram below minimum requirement
10	Fine Art	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 3059.104	235	142	92	43	3.06GHz, 256MB 1)Ram below minimum requirement
11	Food Science	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) D CPU 2.80GHz cpu MHz : 5586.02	488	273	215	101	5.56GHz, 512MB 1) Memory upgrade required
12	Forestry	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.20GHz cpu MHz : 6379.64	227	221	5	31	6.40GHz, 256MB 1)Ram below minimum requirement
13	Fss	vendor_id : GenuineIntel model name : Intel(R) Core(TM)2 Duo CPU E4600 @ 2.40GHz cpu MHz : 4800.0184	995	199	796	39	4.80GHz, 1Gb Passed
14	Guest House	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.80GHz cpu MHz : 2793.047	235	172	63	35	2.80GHz, 256MB 1)Ram below minimum requirement

15	Herbarium	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.80GHz cpu MHz : 2792.936	488	176	312	86	2.80GHz, 512MB 1) Memory upgrade required
16	lace	vendor_id : GenuineIntel model name : Pentium(R) Dual-Core CPU E6500 @ 2.93GHz cpu MHz : 5852.582	1963	263	1699	107	5.85GHz, 2Gb Passed
17	Isae	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 3058.763	479	472	6	168	3.06GHz, 512MB 1) Memory upgrade required
18	Jinja Campus	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) Dual CPU E2140 @ 1.60GHz stepping : 13 cpu MHz : 3192.188	477	299	178	47	3.20GHz, 512MB 1)Ram below minimum requirement
20	Kabanyolo	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) D CPU 2.80GHz cpu MHz : 5585.194	477	332	144	68	2.80GHz. 512 Mb 1) Memory upgrade required
21	Languages	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) Dual CPU E2200 @ 2.20GHz cpu MHz : 4388.446	480	268	212	39	4.40GHz, 512MB 1) Memory upgrade required
22	Law	vendor_id : GenuineIntel model name : Pentium III (Coppermine) cpu MHz : 996.705	52	50	1	10	Critical 1.00GHz, 52MB 1) Ram below minimum requirement 2) Weak processor
23	Lyncon Flats	vendor_id : GenuineIntel model name : Intel(R) Core(TM)2 Quad CPU Q6600 @ 2.40GHz cpu MHz : 9576.516	1492	414	1078	92	9.60GHz, 2Gb Passed

24	Main Building	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 1.60GHz cpu MHz : 1599.928	370	277	92	34	1.60GHz, 384MB 1) Memory upgrade required 2)Weak Processor	
25	Maths	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) Dual CPU E2160 @ 1.80GHz cpu MHz : 3591.302	983	375	607	58	3.60GHz, 1Gb Passed	
26	Misr	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 6134.038	463	457	6	208	6.13GHz, 512MB 1) Memory upgrade required	
27	Muiner	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.80GHz cpu MHz : 2790.877	1511	131	1380	27	2.80GHz, 1.512Gb Passed	
28	Noc	vendor_id : GenuineIntel model name : Intel(R) Core(TM)2 Quad CPU Q6600 @ 2.40GHz cpu MHz : 9577.012	1998	1982	16	1580	2.80GHz, 2Gb 1)Memory upgrade required	
29	Nufu	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.66GHz cpu MHz : 2660.199	243	222	20	34	2.66GHz, 256MB 1) Memory upgrade required	
30	Peace & Conflict	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.00GHz cpu MHz : 5980.342	489	302	186	62	6.00GHz, 512MB 1) Memory upgrade required	
31	Psychology	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 3066.979	452	317	135	51	3.06GHz, 512MB 1) Memory upgrade required	
32	Physics	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.06GHz cpu MHz : 3059.057	235	231	3	27	3.06GHz, 256MB 1) Ram below minimum Requirement	
			DICTS NETWORK MANAGEMENT UNIT				15/04/2013	28

33	Science	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.00GHz cpu MHz : 1992.660	108	105	3	27	2.00GHz, 128MB 1) Ram below minimum requirement 2)Weak Processor
34	Senate	vendor_id : AuthenticAMD model name : AMD Opteron(tm) Processor 242 cpu MHz : 1594.015	491	344	147	69	1.60GHz, 512MB 1)Memory upgrade required 2) Weak Processor
35	Tech						
36	Vet	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 1.60GHz cpu MHz : 1595.308	116	99	16	42	1.60GHz, 128MB 1) Ram below minimum requirement 2)Weak Processor
37	Warm	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.20GHz cpu MHz : 6378.862 cache size : 2048 KB	489	74	415	16	6.40GHz, 512MB 1)Memory upgrade required
38	Womens'	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.40GHz cpu MHz : 2391.099	235	137	98	16	2.40GHz, 256MB 1) Ram below minimum requirement 2)Weak Processor
39	Pharmacy	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 3.20GHz cpu MHz : 6384.324	479	357	121	73	4.40GHz, 512MB 1) Memory upgrade required
40	Economics	vendor_id : GenuineIntel model name : Intel(R) Pentium(R) 4 CPU 2.80GHz cpu MHz : 2793.231	235	232	3	54	2.8GHz, 256MB 1)Memory Upgrade required



Remarks

- Firewalls: Only five firewalls have the required minimum requirements.
- Unit Administrator to take seriously firewall upgrades.
- Administrators got to be aware of what's running on their respective networks.
- It should be noted that improving firewall specifications does not guarantee best internet experience but rather normal operation.

**Thank you for
listening**