

Room Monitoring with APC netbotz

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Occasionally things go wrong in the server room

Cooling failure

Water leak

Power trips

Accidents

Getting locked in

Monitoring of our servers and UPSs provide some information:

e.g. server inlet temperature,

power supply quality

Also BMS sends SMS alert when Air con units power trip

but clearly can do better!

Monitoring the room

We're physicist, we can do it our selves!

Summer intern put together one wire temperature sensor solution.

About 50 sensors around the room connected to EDS HA7Net and in house made sensors

However temperature sensors have bug which means they often report a default value! Control box dos not do snmp (values obtained via http calls)! Does not send alerts!



Got money from Central IT so could buy professional solution
looked at two solutions

CliMate CM-2 Rack Environmental Monitoring Unit



Limited to 16 sensors
Cheap (50% Netbotz cost)
limited online documentation

NetBotz Rack Monitor 550



Up to 72 sensors
Good documentation
APC well known name

Central IT chose APC and brought 60 sensors, 4 web cams
and I brought a leak rope.

Hardware



NetBotz 550

4 web cams, leak rope, alarm beacon, 6 sensors,
4 4-20mA Sensor Inputs, 2 Relay Outputs



Sensor Pod 150 for extending number of sensors
Need additional power if you have more than 9 pods



Temperature & humidity
with display



Temperature



Temperature & humidity



Web cam x4
(audio and door sensor also possible)



Leak rope

Sensors not used



Fire alarm



Vibration



Spot fluid sensor



Dry contact



Door switch

Approximate cost

1* NetBotz 550 ~£1400
4* Camera Pod 160 ~£1000
10* Rack Sensor Pod 150 ~£1500
Leak Rope Sensor ~£175
50* Temperature Sensor ~£2500
10* Temperature & Humidity Sensor ~£750
£7,325

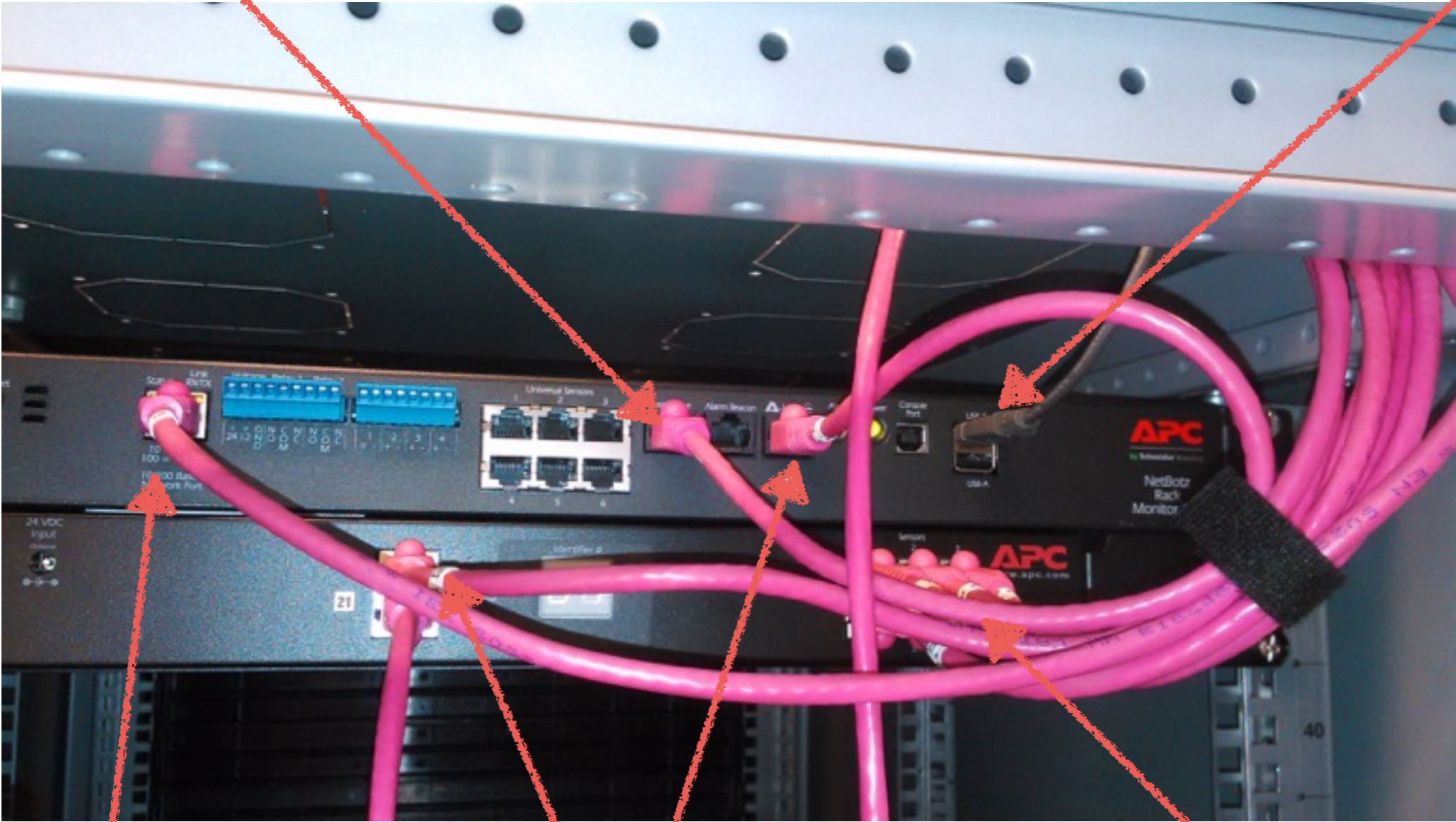
Notes:

If I was paying I would have only brought 12 sensors to monitor the air con
Did not need the 10 Temperature & Humidity Sensor as each Rack Sensor
Pod 150 came with one

Can extend length of sensors using standard ethernet cables

leak rope

connection to web
cams via USB hub



network connection

Daisy chain used to
connect sensor pods

sensors

New temperature sensor

old temperature sensor



leak rope



Software

Netbotz configuration via java app (advanced view)

The screenshot shows the NetBotz Advanced View - Configuration window. The title bar indicates the appliance IP is 192.168.2.73. The interface includes a menu bar (File, Edit, Tools, Window, Help) and a toolbar with buttons for Camera View, Alerts View, Map View, Graph View, Configuration (selected), and About. A left sidebar shows 'Alerting Sensors' with 'Netbotz Wall Monitor 355' selected. Below this is a sensor status table:

Sensor	Reading	Status
A-Link Bus ...	OK	OK
Air Flow	0 m/min	--
Camera Mot...	No Moti...	--
Dew Point	10,9 °C	OK
Ethernet Lin...	Up	--
Humidity	N/A	OK
Temperature	N/A	OK

The main content area is divided into two sections: 'Pod/Sensor Settings' and 'Appliance Settings'. 'Pod/Sensor Settings' includes icons for Alert Action, Alert Profile, Camera Pods (selected), Periodic Reports, and Sensor Pods. 'Appliance Settings' includes icons for Backup, Clock, DNS, E-mail Server, External Storage, Log, Network Interfaces, Proxy, Region, Restore, SNMP, SSL, Upgrade, Users, and Web Server. The bottom left corner features the APC logo and text: 'Last update: 24/08/10 11:03:36 by Schneider Electric'. The bottom right corner shows the email address 'apc@192.168.2.73'.

Web cam and graphs and alerts available via web page

The screenshot displays the NetBotz Rack Monitor 550 web interface. The browser window shows the URL <https://netbotz.esc.gmul.ac.uk/#general/status>. The interface includes a navigation bar with tabs for Status, Alerts, Cameras, Pods, and Sensor History. The 'Alerting Sensors' section shows 'No Alerting Sensors' with a green checkmark. The 'Cameras' section displays four live video feeds from different locations in the SRRF room: Row 1/2, Door, Row 2/3, and Row 3/4. The 'Maps' section shows a detailed floor plan of the SRRF room with various air conditioning units and sensors marked on a grid.

Impose tight firewall rules to limit access to only allowed IP addresses

email alerts

Sensor Pod 150

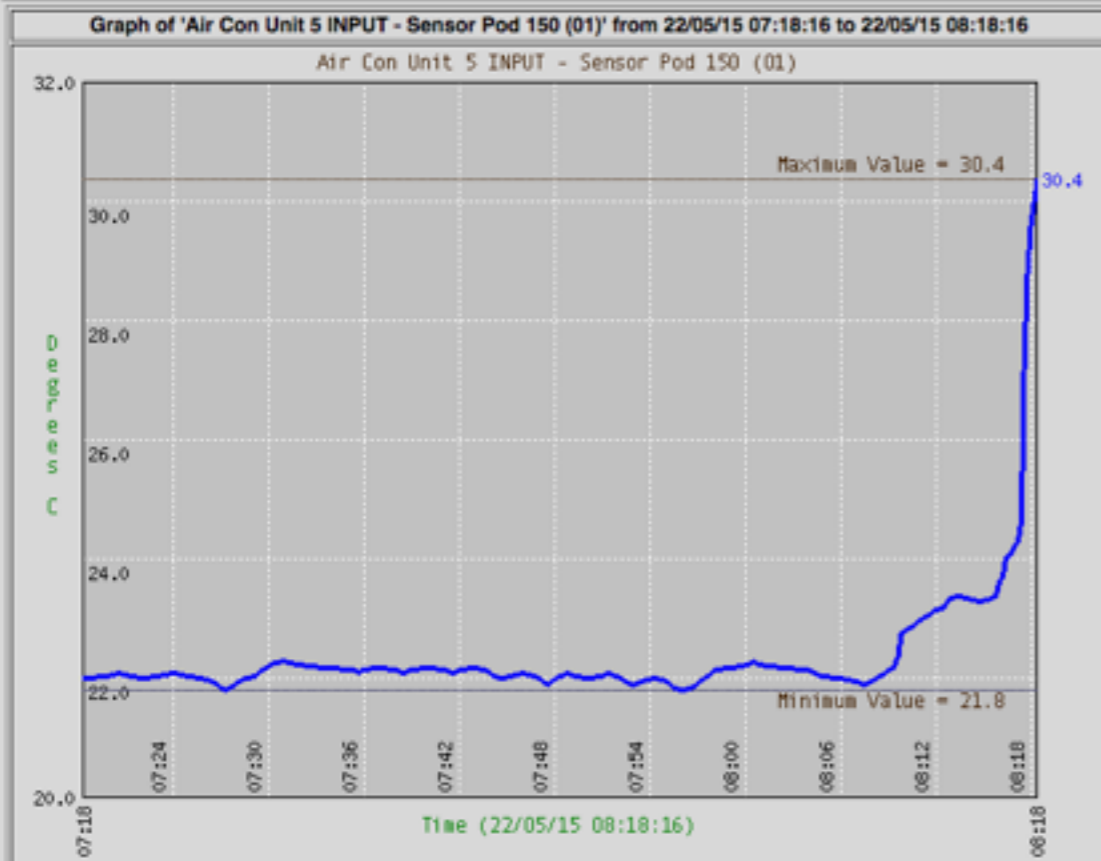
To: Daniel Traynor

Value Too High - Error - Air Con Unit 5 INPUT - Sensor Pod 150 (01)

22 May 2015 08:19

SP

Alert Description:	The current value of 'Air Con Unit 5 INPUT' (30.4 °C) is too high.
Alert Type:	Value Too High
Severity:	Error
Alert Level:	First Alert Level
Sensor:	Air Con Unit 5 INPUT
Sensor Value:	30.4 °C
Access information:	0R
Pod:	Sensor Pod 150 (01)
Time Detected:	22/05/15 08:18:16
Notification Time:	22/05/15 08:18:16
Threshold Name:	Default
Action Name:	Primary E-mail Notification
Location:	SRIF room, row 1, rack 5, 36U
Alert ID:	nbErrorCond_AFD48D38
Version:	V4_4_2_20141212_1452



Sensor Pod 150

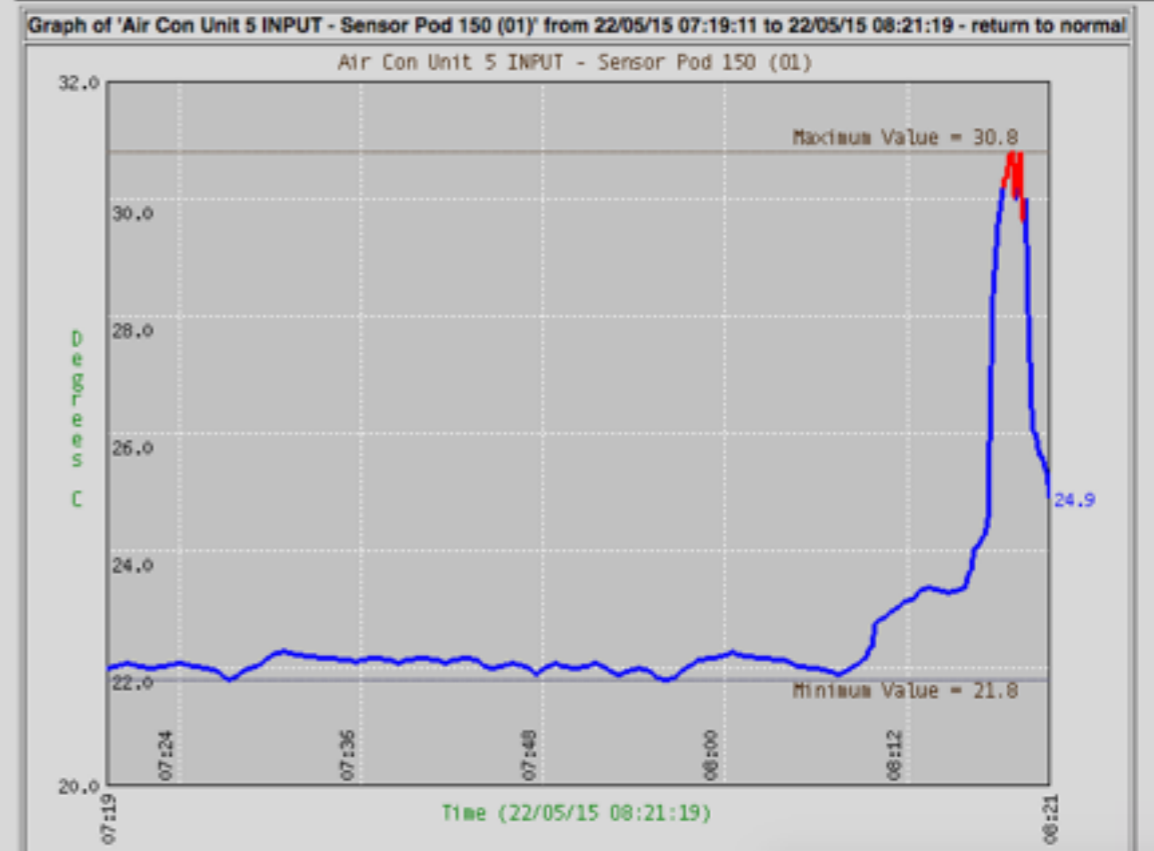
To: Daniel Traynor

Value Too High (returned to normal) - Error - Air Con Unit 5 INPUT - Sensor Pod 150 (01)

22 May 2015 08:23

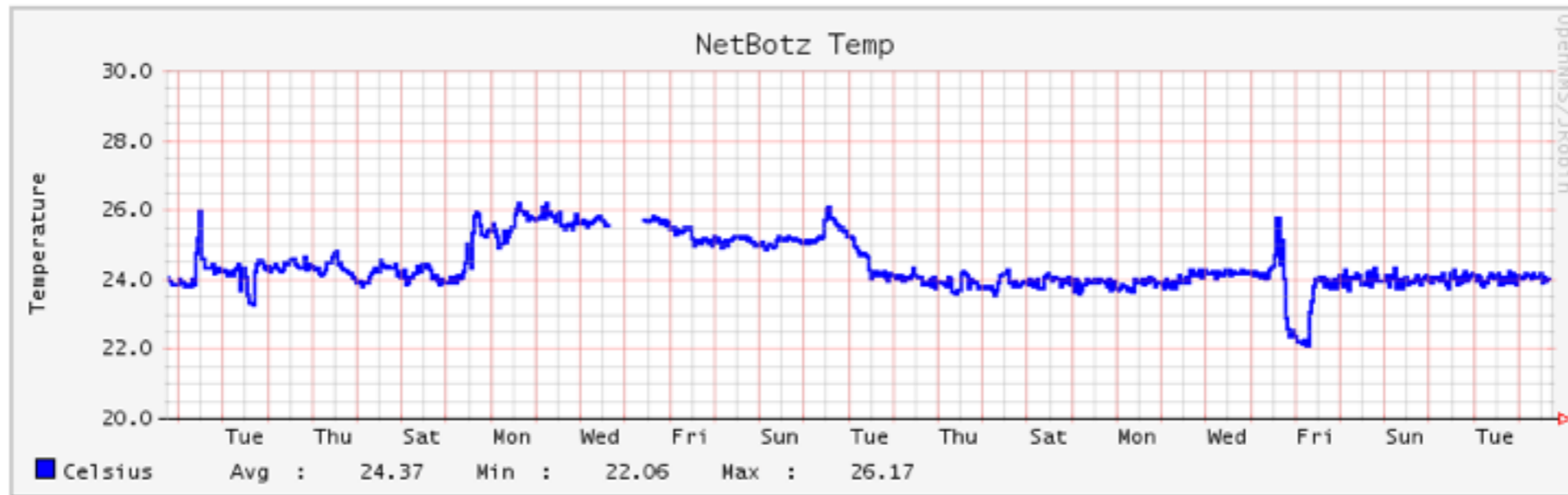
SP

Alert Description:	The value of 'Air Con Unit 5 INPUT' was too high, but has now returned to normal.
Alert Type:	Value Too High
Severity:	Error (returned to normal)
Alert Level:	Return To Normal
Sensor:	Air Con Unit 5 INPUT
Sensor Value:	24.9 °C
Access information:	0R
Pod:	Sensor Pod 150 (01)
Time Detected:	22/05/15 08:19:11
Time Returned to Normal:	22/05/15 08:19:25
Notification Time:	22/05/15 08:21:19
Threshold Name:	Default
Action Name:	Primary E-mail Notification
Location:	SRIF room, row 1, rack 5, 36U
Alert ID:	nbErrorCond_01495109
Version:	V4_4_2_20141212_1452

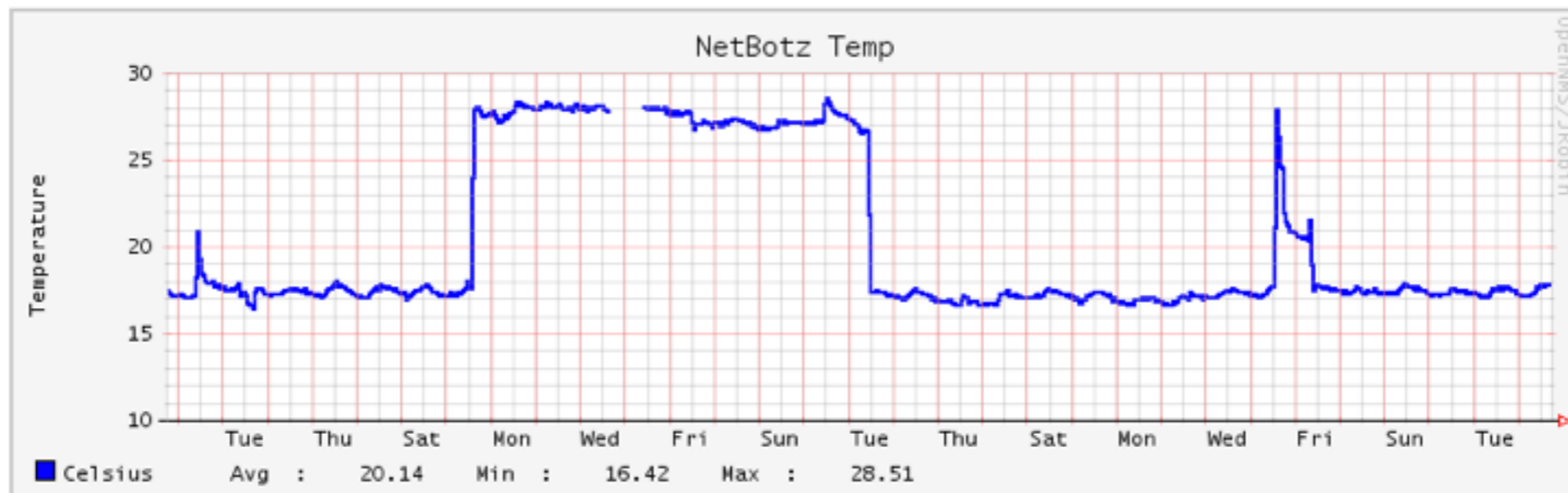


longterm monitoring using SNMP via OpenNMS

Node: netbotz_esc.qmul.ac.uk
Netbotz2 Temp Sensor: Air Con Unit 5 INPUT



Node: netbotz_esc.qmul.ac.uk
Netbotz2 Temp Sensor: Air Con Unit 5 OUTPUT



not only but also

We've got a server lifter



and a couple of crash carts

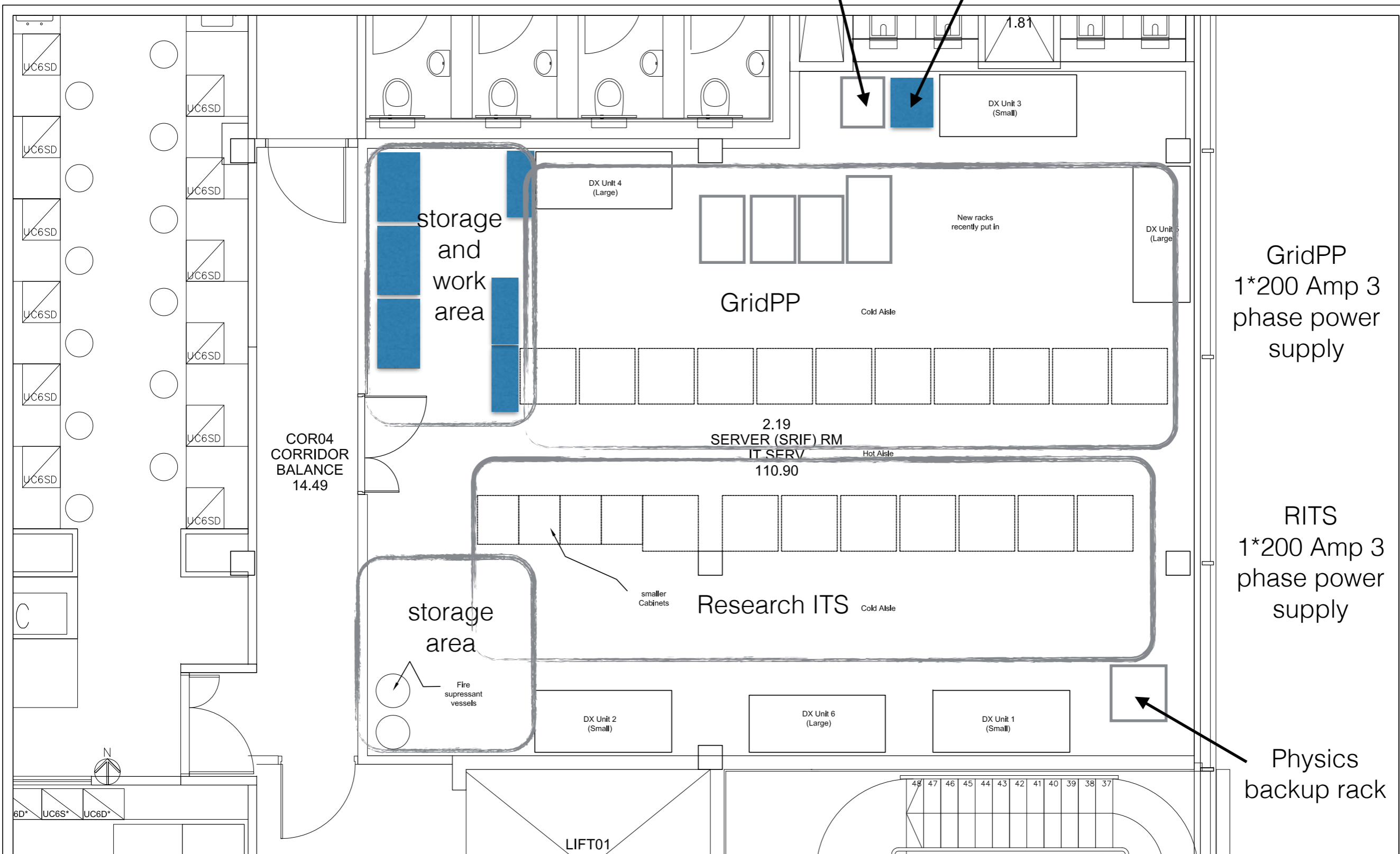


Summary

- Installed and configured room monitoring system based on APC Netbotz 550.
- Enables continuous monitoring of server room including temperature, humidity, water leaks and activity with alerts sent via snmp and email (SMS also possible).
- Significantly improved on previous monitoring.
- Other solutions exist and if you are interested in fewer sensors might be cheaper.

ITS network rack

Physics backup safe



UC6SD

UC6SD

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UC6S*

UC6D*

Building	Scale	Date	Drawn by: LP
THE JOSEPH PRIESTLEY BLDG	1:50@A3	19-10-12	Checked by:
Title	Drawing No.	Revision	
SECOND FLOOR IT SERVER (SRIF) ROOM as EXISTING	WBB/ME/----	----	

48	47	46	45	44	43	42	41	40	39	38	37
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