

JOINT NETWORK MANAGEMENT COMMITTEE
Network and Telecoms Operations Report
21st July 2022

NETWORK SYSTEMS

Janet Link Upgrade

The upgrade of the UDN's connection to Janet from [a redundant pair of] 2x 10Gbit/s to 4x 10Gbit/s is scheduled to be completed in two stages:

1. The primary connection on Tuesday, 11th July, starting 07:30, and
2. The secondary connection on Wednesday, 20th July, starting 08:00.

The new configuration has been tested in a lab environment and appears to function correctly. If, however, there is a problem during the primary upgrade which cannot be resolved on the day, a backup session is organised for the following day — Wednesday, 12th July. The secondary session is expected to proceed smoothly if the primary one has been completed successfully.

During the changeover, traffic should reroute via the other connection and border SNAT.

As stated at the previous JNMC, some traffic will be configured to bypass the IPS as it only provides 2x 10Gbit/s connections on either side of it and avoid it from become saturated with the increased traffic volume. Security Operations have provided some UDN address ranges to bypass.

UDN service charges for AY 2022-2023

As reported a previous JNMC, the Catalyst 3850 series of switches used for the UDN PoP service have been discontinued in favour of the Catalyst 9000 series (9300 and 9500, typically). Because of a change in models and licensing, there is often not a 1:1 correlation with the equivalent new model. In addition, recent changes due to inflation and global semiconductor availability have affected pricing.

Recurrent pricing supports the operation of the backbone (core, distribution and border) and rental of GBN circuits, as well as fund the replacement of the equipment.

Due to changes which will be brought on by the network Defragmentation project, it is not expected that the next generation of the UDN will be in the same form as the present network, with a move towards "site networks" which are connected together by a smaller core. This will see a dramatic reduction in the number of PoPs (limited to Colleges and a small number of affiliated institutions).

As such, the equipment replacement element of the charge may not map directly to the equivalent new service but there is a need to continue to accumulate funds to replace the backbone equipment and PoPs, or their new equipment.

Full details of the changes are shown in the table at the end of this report.

The price for the 24-port 1GE PoP (the most common option at 84 of the 177 connections [= 47.5%]) has been artificially held low to avoid penalising the majority of customers but this has probably held back customer upgrades as the subsidy has been obtained from the 10GE options. As such, it is

proposed to increase this connection by the current rate of Consumer Price Inflation of 7.9%¹ from £2,742 to £2,958.

The remainder of the options have been calculated based on the new offerings with the appropriate subsidy transferred. Some of these have increased and some have decreased to changes in equipment prices — the largest increase being the split PoP by 5.7% and the 24-port SFP+ switch decreasing by 10.8%. The BGP connection decreases most, by 13.3% (due to it not needing to subsidise the 24-port 1GE PoP by so much).

The current prices (last revised in November 2020) will be used for AY 2022-23, without any inflationary increase, but the new prices will come into effect for AY 2023-24. If inflation continues at the present level, it may be necessary to revise this again, prior to that date, but the new prices are expected to be advertised once the billing for 2022-23 have been completed.

The committee's approval of these changes is sought.

UPS Service Closedown

It is proposed that the UPS service is ceased, except for cases where the UIS also provides a Managed Network Service. Previously, the PoP service included a UPS, introduced as part of the VoIP project, but this was removed several years ago, as many customers provided their own or no longer required it.

Customers were given the opportunity to continue to have a UPS but would be charged a recurrent fee to cover battery and equipment replacement. Many of the UPSs now require a battery replacement as well as a the UPS chassis itself, so replacing these now would incur a significant cost, as well as a large amount of logistical work by the Installations team.

Individual customers will be contacted and advised that they will need to obtain and run their own UPS, if they wish to continue to have one. The UIS can remove the old unit, if required. They will not be billed for AY 2022-23.

The committee's approval of this is sought.

High institutional traffic de-prioritisation

Occasional incidents of high volume traffic from institutional networks to Janet have resulted in the connection to Janet becoming saturated and degrading service for other users. The increased bandwidth to/from Janet will help alleviate this issue but the nature of the link — consisting of traffic hashed across multiple 10Gbit/s channels — can result in a single 10Gbit/s flow saturating a particular channel.

As part of a trial, we plan to install a traffic shaping policy that will 'deprioritise' traffic from an institution when it exceeds a defined level — probably about 5-6Gbit/s. This will involve remarking the traffic as it enters the UDN backbone and, whenever a link is oversubscribed, it will dropped in preference to other traffic.

This can only control traffic heading from an institution — either to Janet or another institution — and not from Janet to an institution.

Data Centre Network replacement

A replacement network for UIS-managed data centres (spanning three sites) has been procured and ordered. Current lead times for equipment mean that delivery is not expected until early 2023.

The new network will replace the existing network that supports many University-wide services (including ERP systems) with increased bandwidth and flexibility, and is expected to support a federated management platform with API access, enabling greater use by institutions over time.

DDI Replacement

Work on this project is expected to commence after the border router upgrade is complete

Current offering	New offering	Previous count	Current count	Current install	Proposed install	Current recurrent	Proposed recurrent	%change
24x 1G RJ-45	-	93	84	£12,588	£12,074	£2,742	£2,958	+7.9%
48x 1G RJ-45	Discontinue	3	3	£17,118	-	£5,312	£5,267	-0.1%
12x 10G SFP+	16x	41	57	£15,765	£17,638	£5,119	£5,029	-1.8%
24x 10G SFP+	10/25G	6	4	£21,758	£19,779	£5,975	£5,335	-10.8%
12x 10G SFP+ Split PoP	16x	0	8	£22,142	£26,536	£6,030	£6,372	+5.7%
12x 10G SFP+ Router	16	1	1	£27,910	£35,989	£6,902	£9,535	+38.1%
BGP	-	18	19	£9,759	£8,862	£4,261	£3,694	-13.3%

Table of UDN connection offerings and changes to charges.

The 'new offering' is where the replacement switch offers a different configuration due to the change from a Cisco Catalyst 3850 series switch to a Catalyst 9300/9500 series switch.

The 'previous count' and 'current count' give the number of connections at the time the current pricing model was calculated vs the present time (July 2022).

The 48x 1G RJ-45 PoP has not proven popular and all the customers are likely to be removed following Defragmentation.

GBN/INSTALLATIONS

1. PIA Opportunities

GBN exploring further opportunities to use PIA to connect outlying boathouses, such as the Combined Colleges Boathouse, and Hamilton Kerr Institute in Whittlesford.

2. Network Diversions

On-going:

1-3 Hills Rd – University disposing of the asset requiring a significant project to remove the GBN from the site

St John's Buttery – Reinstatement of the GBN route through the Buttery

3. Network Extensions

In Progress:

Cav III: New Physics Laboratory at West Cambridge.

Boathouses: Pembroke, Clare, Emma & Downing pending wayleave application.

CISL, 1 Regent's St: relocation to new premises

King's College: Diverse GBN node for main site

Astra Zeneca HQ at CBC: GBN node installed

West Cambridge Site external WiFi project

Completed:

Atria: Adding GBN node for new UoC building on CBC

4. College GBN Works

Completed: Barton Rd (King's)

In Progress: New Ct, Emma College (Emma), Wilberforce Rd (St John's), Pound Hill (St John's), 35b Grange Rd (Selwyn), New Porter's Lodge Development (St Ed's), Girton Gatehouse (Girton)

5. Network Installations (LAN)

Geography Migration: As part of the Geography migration to UIS services, NI carrying out a full replacement of department IT cabinets, local fibre and structured copper wiring. - Ongoing

6. University Residences WiFi Rollout

Southacre Flats, Chaucer Rd & Panton St: costs being reviewed by Accommodation Office

Northwest Cambridge for Accommodation Office: Progressing with collating costs and site data

7. Light Blue Fibre

GBN team continuing to support LBF with inquiries.

Currently exploring opportunities with Jisc to support St Mary's School and Stephen Perse Foundation

WIRELESS

For Wireless:

- Homerton College have joined the Wireless Service
- The EAP-TLS and eduroam feasibility study is ongoing.
- WPA3 / Wi-Fi 6E technologies are currently under active testing by the team. The results of this will form part of our deployment strategy.
- For Local SSIDs and UniOfCam, work is continuing on a stakeholder consultation survey.
- A further document on Wi-Fi LAN standards should be distributed for comment before the next meeting (21st July).
- Early discussions have commenced on how we could supply a 'institutional IoT' style SSID.

Attached papers:

- Wireless Service LAN standards v3 – paper 198

TELECOMS

21/07/2022