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Case ref: 71-22127 – Planned Maintenance on 20/01/16 resulting in a Major Service Outage (MSO) 21/01/16.

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1. Report Aims

This report has been produced by Datanet to provide further detail and clarification of the issues which impacted the entire Datanet core network, resulting in a loss of services on the 21st January 2016.

2. Customer Impact, Experience & Affected Infrastructure

As communicated to customers, Datanet proceeded with the planned maintenance on Wednesday 20th January 2016 at 23:00hrs. The planned maintenance consisted of replacing the existing Cisco 6503 core equipment at Telecity HEX with a Juniper MX104 and EX switching stack.

The customer impact of this Major Service Outage varied from some customers facing no impact at all to others facing a complete and prolonged loss of services. In some cases, the disruption on our network was noticeable across other third party networks.

3. Incident Summaries

We had two engineers in attendance at Telecity (HEX) from 22:00hrs (20/01/16) until 09:15hrs (21/01/16) and two engineers in attendance at Aspen House (AHF) starting at the same time for a longer duration. The day support staff started as per normal at 08:00hrs.

At 04:40hrs (21/01/16) the engineering team acknowledged that the move to a Juniper core at HEX was successful with the exception of four customer services which we felt could be promptly resolved and work continued to address these. The HEX engineers departed at 09:15am to return to AHF.

Just before 09:30hrs, we started to receive calls on the Support Desk reporting issues with access to data centre services and certain wide area network connections provided through our infrastructure as customers were starting to come online for the day.

At 10:30hrs the two London engineers were now back at AHF and all the engineering team met to discuss the issues which were becoming apparent. The decision was taken to return to HEX and roll back the changes made during the maintenance period i.e. revert back to the Cisco core equipment.

At 13:00hrs a subset of the engineering team had arrived at HEX and carried out the roll back procedure. The engineering team back at AHF further advised that we were experiencing a high level of packet loss through our Telehouse North (THN) node and it was decided that this equipment should be restarted and a time of 14:30hrs was agreed. The Support Desk notified as many data centre customers as possible in the short time available. The engineers departed for THN at 14:00hrs.

At 14:30hrs the core switch in THN was restarted and almost immediately we started to see the situation improve for all customers. The engineering team remained at THN until confirmation was received by customers who directly took services with us in this location and via HEX.

4. Root Cause

The root cause of the failure was identified as multiple broadcast storms created as a result of introducing the Juniper equipment into the core environment, the impact of which was not fully appreciated until much later, when multiple customers were attempting to access services inside the Datanet network.

5. Risk Mitigation, Key Observations & Lessons Learnt

As part of the planned maintenance, we agreed a nominated list of customers who would be contactable during the maintenance window to test access to services. This process worked well, but as we later discovered was no indication as to how the network would perform under increased demand.

Given the severity of this network upgrade, the decision was taken to focus our first phase on the HEX site given that this location has the least number of directly connected customer services and operates in failover with THN.

The key observation following our recent planned maintenance is that our approach to the project from a technical standpoint needs to change. The project approach going forward will now change entirely from what was a site by site change of equipment, to a customer by customer migration to the new Juniper network.

This new approach is entirely low-risk and prevents any significant changes to the existing core network. To achieve this, we will build out our new Juniper core entirely, prior to the migration of any customer services across our network.

Should any customers have concerns regarding the new approach we are adopting to achieve our 10Gb network upgrade, we welcome comments and are prepared to share detailed information on a one to one basis.