

IST-2001-32603

Deliverable D 1.5.3  
Six monthly report on the Usage of 6NET and a list of  
activities supported



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**Abstract:**

This document gives details of the usage of the 6NET network over the six-month period, and lists the activities supported.

**Keywords:**

IPv6, usage, 6NET, tunnel, fault report

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## 1. INTRODUCTION

Deliverable 1.5.3. gives an overview of the usage of the 6net network during the last six months from January 2003 to June 2003. During the first year of the project, 6net participants built up the network installing backbone, national and local loops circuits. Each participant was provided with the hardware necessary for connecting to the core, and almost all NREN and Universities were connected based on native IPv6 connections or via MPLS/CCC Layer 2 solution using GEANT resources, such as GR or via Ipv6-into-Ipv4 tunnels as Cesnet, PSCN and Hungarnet.

In the last 6 months, tunnels have been substituted by native STM1 connections in Cesnet and in Hungarnet and PSCN is now connected via MPLS/CCC Layer 2 solution. NTT, the Asian ISP has been connected natively to 6net core to UK router.

Two temporal gateways between GEANT and 6net were installed during this period to provide Ipv6 connectivity to NRENs still not connected to GEANT. These interconnections carry Ipv6 traffic between NREN only connected to 6net and NREN only connected to GEANT. These gateways will be in place until end of the year when all NREN will be connected to GEANT in Ipv6.

D1.5.3. starts with a Management Overview, including a network configuration map and connection overview. The Overview also contains a report on faults and other problems with the network, based on the Trouble Tickets, and an availability table. The Trouble Tickets and the Traps are used to determine the availability of the Service. Finally there is a section on network performance, with various traffic graphs and charts, which gives a more in-depth view of the separate circuits.

## 2. LIST OF ACTIVITIES

The most significant part of the activities done in the last six months was done to finish the NREN connectivity, Cesnet and Hungarnet were connected natively and PSCN was connected via an Layer 2 solution.

NTT, Japanese ISP was connected natively to UK router giving connectivity to several Asiatic autonomous systems.

The test activity started in 6net with the deployment of multicast IPv6 within the core. SURFnet, Uninett, SWITCH and Renater introduced natively multicast IPv6 in 6net as a test in April 2003 but partners and testers decided to leave the configuration in the core due to high interest in deploying and testing multicast v6. In the following months, it is expected rest of NRENS to participate in the testing and adjust their configuration for that purpose.

The daily maintenance and operation is being done by 6net NOC. They have the responsibility to keep the core network stable and they have followed the procedures described whenever there has been a faulty in the network. Special trouble ticket were created for following the 6net problems.

6TAC (Technical Assistance Centre), Cisco help desk has provided support in case of Software and Hardware problems related to the 6NET router provided by Cisco.

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### 3. MANAGEMENT OVERVIEW

#### 3.1. CONNECTION OVERVIEW

NRENs	Speed <i>Mbps</i>	Connected Since
ACONET	155	
CESNET	155	18-Feb-2003
DFN	155	
GARR	155	
GRNET	155	
HUNGARnet	9	23-Sep-2002
JANET/UKERNA	155	25-Jun-2002
NORDUNET	2,500	11-Jun-2002
NTT	2	28-Feb-2003
POZNAN	1,000	12-Jun-2003
PSNC	9	11-Jun-2002
PSNC 2	9	3-Oct-2002
RENATER	155	
SURFNET 1	155	13-Jun-2002
SURFNET 2	155	13-Jun-2002
SWITCH (CERN)	155	12-Jun-2002

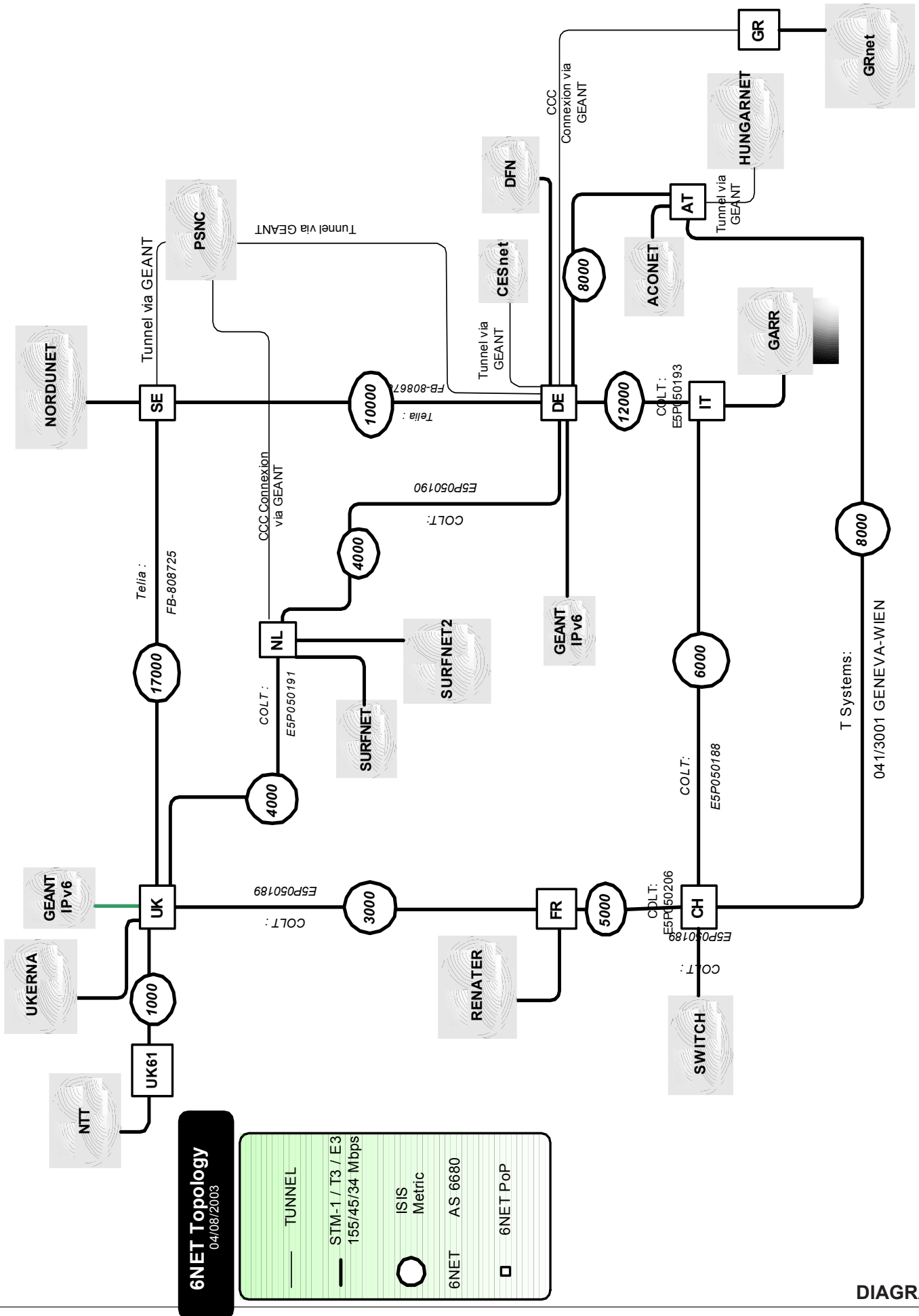
Trunks	Speed <i>Mbps</i>	Connected Since
AT ↔ CH	155	28-May-02
AT ↔ DE	155	29-May-02
CH ↔ FR	155	28-May-02
CH ↔ IT	155	28-May-02
DE ↔ GR		28-May-02
DE ↔ IT	155	28-May-02
DE ↔ NL	155	29-May-02
DE ↔ SE	155	28-May-02
FR ↔ UK	155	28-May-02
NL ↔ UK	155	28-May-02
SE ↔ UK	155	29-May-02
UK ↔ UK61	34	28-Feb-03

### 3.2. CONNECTIONS TO OTHER IPV6 PROJECTS/NETWORKS

Once the pan-European network was operational and stable with all NREN (except the new partners) and most of the end users connected, the initiative to link to North America and Asia was started. In October/November 6net was already connected to Abilene via NORDUnet and SURFnet using native connections. The connection to NTT in Japan was already in place, the port adapter to connect to from the 6net site was delivered mid of February.

NTT was connected via the 6net PoP in London.

Moreover, 6net is connected to Euro6IX (IST project) via UKERNA/ UK6X, to 6BONE and other IPv6 research networks.



### 3.4. MONTHLY ACTIVITIES

#### JANUARY

#### **Circuits (NREN Access) or Gateway or Providers Access operational:**

HUNGARnet was natively connected to the 6NET router in Vienna on January, the 30th. The tunnel was removed the same day after the validation of the native connection.

#### **The Service**

The re-activation of MD5 authentication on EBGP peerings was still ongoing.

The 6NET Partners Read-Only access configuration was still ongoing.

The 6NET Partners SNMP Read-Only access on their directly connected directly connected core routers were still ongoing.

Due to MTU limitation on the tunneled source interface (= Ethernet interface), new FastEthernet card were being delivered on 6NET PoPs that provide tunneled connections : Vienna, Frankfurt and Stockholm. The 8FE card was delivered and installed in Stockholm on January, the 29th. The FastEthernet card was delivered on the Frankfurt router on January, the 28th. The FastEthernet card was delivered and installed in Stockholm on January, the 29th.

Until this delivery, the 6NET routers in Vienna, Frankfurt and Stockholm were downgraded to 12.0(22)S on January, the 16th and 17th. These routers were re-upgraded to 12.0(23)S1 after the delivery of the FastEthernet card or of the native connection. Hence, the router in Vienna was re-upgraded on January, the 30th.



**FEBRUARY****Circuits (NREN Access) or Gateway or Providers Access operational:**

CESnet was natively connected to the 6NET router in Frankfurt on February, the 18<sup>th</sup>. The tunnel was removed the same day after the validation of the native connection.

NTT was newly and natively connected to the 6NET Network in London thru a c7200 router (uk61.uk) on February, the 28<sup>th</sup>. The link between uk61 and NTT is an E1.

**The Service**

The re-activation of MD5 authentication on eBGP peerings is still ongoing.

The 6NET Partners Read-Only access configuration is still ongoing.

The 6NET Partners SNMP Read-Only access on their directly connected directly connected core routers are still ongoing.

On each 6NET Core router, the BGP configuration has been cleaned and a 64Mb PCMIA has been installed in slot1.

On each PoP, a 6NET dedicated VLAN (VLAN 60) has been configured with new IPv4 addresses, in order to allow an access to the 6NET routers for all the 6NET Partners.

On the French PoP, the router fr6.fr has been upgraded from IOS 12.0(23)S1 to IOS 12.0(24)S, as a test for future global 6NET upgrading.

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**MARCH****Circuits (NREN Access) or Gateway or Providers Access operational:**

None.

**The Service**

Beginning of March, peering between NTT and 6NET has been established, after UK61 has been put into operation.

On the 7th, tight SLA tuning (per Cisco recommendation) has been configured on all 6NET routers. This is to enhance router configuration and convergence behavior, with commands at various levels (global configuration, interfaces, BGP, ISIS).

All 6NET routers have been upgraded with the Cisco IOS 12.0(24)S, from 11th to the 14th March.

All BGP peerings (but JANET, GARR, NTT) are now authenticated with MD5.

A read-only access has been configured to allow all NRENs to connect to all 6NET routers. An IPv6 access-list to limit access to the NRENs has been added as well.

**April**

**Circuits (NREN Access) or Gateway or Providers Access operational:**

None.

**The Service**

MD5 authentication was finalized on all EBGP peerings, the last one being to SINET on the 15/04.

SSH was configured on all 6NET routers on the 08/04. A single access has been enabled for all NRENs, on all routers. Previous accesses have been maintained, per NRENs requests, for the time being.

Tests conducted showed SNMPv3 was not compatible with InfoVista, but can be configured in parallel to SNMPv2.

UK61 IOS version was upgraded to 12.2(13)T .

**MAY**

**Circuits (NREN Access) or Gateway or Providers Access operational:**

None.

**The Service**

All 6NET routers were upgraded to gsr-k3p-mz.mcast6.eft.20030325 for the multicast tests.

Read/write logins and passwords were sent to the multicast test participants.

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**JUNE****Circuits (NREN Access) or Gateway or Providers Access operational:**

Gateways with GEANT were implemented in DE and NL. Gateways with GEANT were implemented in DE and NL.

Those gateways are only for traffic between 6NET-only and GEANT-only NRENs. They run at STM-1 speeds.

A new CCC connection has been configured for POZNAN's access, across GEANT, landing on NL6. This was made possible after replacing the GE card in NL6, and adding a GE port to the GEANT NL1 router.

**The Service**

NL6 was moved up in the rack, to free space for another equipment. During the same maintenance window, the 3xGE was replaced by a 4xGE which supports multicast IPv6.

All 6NET routers were upgraded to gsr-k3p-mz.mcast6.eft.20030521 for the multicast tests

On-going support during the multicast tests

## 4. FAULT REPORT

### 4.1. TROUBLE TICKETS

This section contains the trouble ticket summary and the network availability for the reporting period. All times are in UTC.

Trouble tickets are assigned to seven categories. Bellow is the description of these categories:

<b>Trouble Ticket Classes</b>	<b>Description</b>
AC	ATM VC Configuration Problem
LF	Line Fault
RC	Routing Configuration Problem
RH	Router Hardware fault
RS	Router Software fault
SE	Security problem
SM	Scheduled Maintenance
UM	Unscheduled Maintenance
UP	Unidentified Problem
OT	Other

Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
353870	15/01/2003 11:19	15/01/2003 14:00	2:41	LF	143174	Loss of Connectivity 6NET-NL-UK / Power recovery on a bandwidth manager in London / Colt TT 143174
358548	28/01/2003 04:15	28/01/2003 05:20	1:05	LF	647935	Loss of connectivity 6NET - AT - CH / Maintenance completed / T-Systems reference 647935
351659	08/01/2003 01:06	08/01/2003 02:52	1:46	LF	NMCP6310	The planned work is finished. The trunk 6net SE6 - UK6 is back online
353997	29/01/2003 01:02	29/01/2003 04:21	3:19	LF		Scheduled Outage SE6 - DE6 / Maintenance completed / No reference from provider
357583	24/01/2003 08:15	24/01/2003 08:15	0:00	LF		Scheduled operation / Patching done / PoP AT
357956	29/01/2003 08:00	29/01/2003 09:58	1:58	OT		8-Port Ethernet Card Install / SE6 The card installation has been successfully completed.
358326	27/01/2003 12:37	27/01/2003 18:00	5:23	RC	20030127-1	Schedule Maintenance / SURFNET router upgrade successfully completed.
354417	16/01/2003 09:00	16/01/2003 09:15	0:15	RC		HUNGARnet tunnel problem / To try to fix HUNGARnet problem, at6.at will be downgraded to 12.0(22)S.
354759	16/01/2003 16:45	16/01/2003 17:15	0:30	RC		AT6 has been downgraded to 12.0(22)S, the tunnel with HUNGARNET is working now.
355015	17/01/2003 08:30	17/01/2003 09:00	0:30	RC		SE6 has been downgraded to 12.0(22)S
355016	17/01/2003 08:45	17/01/2003 09:15	0:30	RC		DE6 has been downgraded to 12.0(22)S
359923	31/01/2003 08:30	31/01/2003 08:45	0:15	RC		AT6 has been upgraded to 12.0(23)S
359543	30/01/2003 11:00	30/01/2003 11:20	0:20	SM		Direct connection of Hungarnet to AT6 via an STM1 successfully completed.

Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
366353	18/02 00:12	18/02 04:40	4:28	LF	Telia 4765587	Loss of connectivity SE6 - UK6 / Maintenance window not notified by the local provider
361047	07/02 08:10	07/02 08:12	0:02	OT	Colt UK144969	Schedule Maintenance NL6 / Flash card inserted
361048	05/02 16:10	05/02 16:20	0:10	OT		Scheduled Maintenance FR6 / Vlan 60 Configured
361050	05/02 16:10	05/02 16:20	0:10	OT		Scheduled Maintenance IT6 / Vlan 60 Configured
361053	03/02 16:15	03/02 16:20	0:05	OT		Schedule Maintenance UK6 / Flash card inserted
361056	03/02 16:16	06/02 13:55	0:05	OT		Schedule Maintenance CH6 / Flash card inserted
361951	06/02 08:20	06/02 08:25	0:05	OT		Scheduled Maintenance AT6 / Vlan 60 Configured
362761	06/02 16:31	07/02 08:48	0:05	OT		Scheduled Maintenance SE6 / Flash card inserted
355015	16/01 18:37	06/02 16:56	4:20	RC		Schedule Maintenance SE6 / Downgrade to 12.0(22)S / Installation 8FE / Upgrade to 12.0(23)S1
367144	19/02 15:39	21/02 10:35	13:56	RC		Schedule Maintenance All 6NET routers / BGP Configurations Cleaned
367894	25/02 09:00	25/02 09:45	0:45	RC		Scheduled Maintenance AT6 / Vlan 60 Configured
367897	26/02 09:00	26/02 10:00	1:00	RC		Scheduled Maintenance CH6 / Vlan 60 Configured
367900	27/02 09:00	27/02 09:45	0:45	RC		Scheduled Maintenance FR6 / Vlan 60 Configured
367901	27/02 09:00	27/02 09:45	0:45	RC		Scheduled Maintenance GR6 / Vlan 60 Configured
367902	21/02 12:12	27/02 12:15	0:45	RC		Scheduled Maintenance IT6 / Vlan 60 Configured
367903	21/02 12:12	27/02 12:15	0:45	RC		Scheduled Maintenance NL6 / Vlan 60 Configured
362231	07/02 17:22	18/02 13:23	1:15	OT		Schedule Maintenance / DE-CZ Connectivity



Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
371130	14/03 03:00	14/03 03:00	0:00	SM		T-Systems
372064	06/03 01:44	06/03 01:52	0:07	SM		Scheduled Maintenance AT6 - DE6 / Maintenance done successfully / T-Systems
372166	07/03 09:00	07/03 11:30	2:30	SM		Scheduled maintenance 6NET routers / Tight SLA tuning configuration / 6NET NOC
372683	11/03 09:00	11/03 09:30	0:30	SM		Scheduled maintenance AT6 router / IOS upgrade / 6NET NOC
372686	12/03 09:00	12/03 09:30	0:30	SM		Scheduled maintenance DE6 router / IOS upgrade / 6NET NOC
372688	12/03 09:30	12/03 10:00	0:30	SM		Scheduled maintenance IT6 router / IOS upgrade / 6NET NOC
372690	13/03 09:00	13/03 09:30	0:30	SM		Scheduled maintenance SE6 router / IOS upgrade / 6NET NOC
372708	11/03 09:00	11/03 09:30	0:30	SM		Scheduled maintenance CH6 router / IOS upgrade / 6NET NOC
372709	12/03 09:00	12/03 09:30	0:30	SM		Scheduled maintenance GR6 router / IOS upgrade / 6NET NOC
372710	13/03 09:00	13/03 09:30	0:30	SM		Scheduled maintenance NL6 router / IOS upgrade / 6NET NOC
372711	13/03 09:30	13/03 10:00	0:30	SM		Scheduled maintenance UK6 router / IOS upgrade / 6NET NOC
374492	14/03 09:00	14/03 10:00	1:00	SM		Scheduled maintenance CH6 - Switch / BGP MD5 authentication configuration / 6NET NOC
374903	18/03 09:00	18/03 10:00	1:00	SM		Scheduled maintenance AT6 - ACONet / BGP MD5 authentication configuration / 6NET NOC
375920	18/03 12:20	18/03 12:30	0:10	SM		Scheduled maintenance GR6 - GRnet / BGP MD5 authentication configuration / 6NET NOC
375959	21/03 09:00	21/03 10:00	1:00	SM		Scheduled maintenance DE6 - CESnet / BGP MD5 authentication configuration / 6NET NOC
377020	25/03 09:00	25/03 10:00	1:00	SM		Scheduled maintenance SE6 - POL34 / BGP MD5 authentication configuration / 6NET NOC
377212	25/03 09:00	25/03 10:00	1:00	SM		Scheduled maintenance AT6 - HUNGARnet / BGP MD5 authentication configuration / 6NET NOC
378983	28/03 09:00	28/03 10:00	1:00	SM		Scheduled maintenance 6NET routers / ipv6 VTY RO access for the NRENs configuration / 6NET NOC
379661	31/03 00:04	31/03 00:40	0:36	LF	706084	Loss of Connectivity AT6 - DE6 / No reason for outage / T- systems Trouble ticket :706084

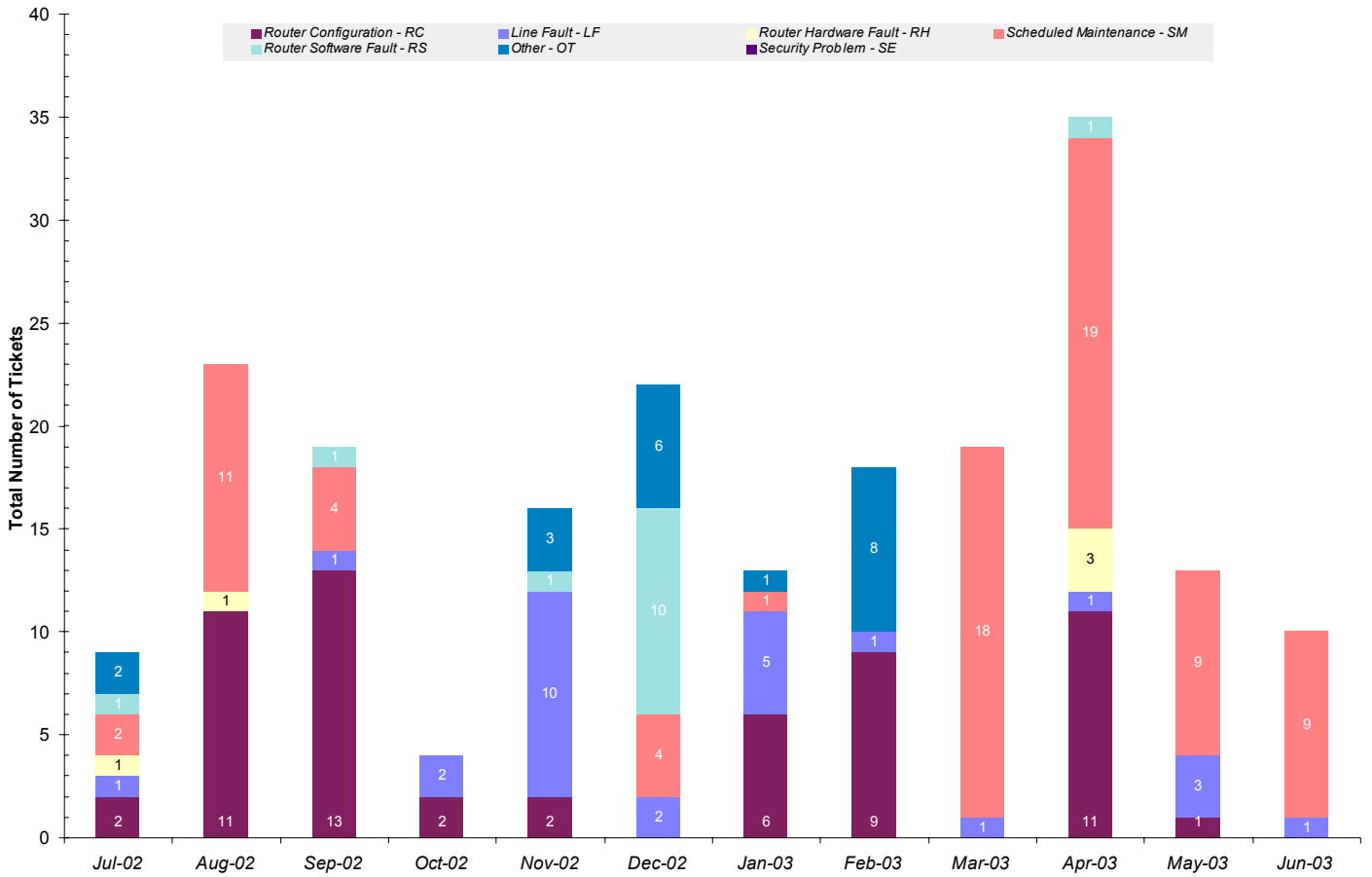
Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
387212	24/04 12:30	24/04 13:15	0:45	LF	Colt 0221689	Loss of Connectivity DE6 - NL6 / After Rebooting NL6.NL, connection is established / Colt reference : 0221689
387214	24/04 12:30	24/04 13:15	0:45	LF	Colt 0221689	Loss of Connectivity NL6 - UK6 / After rebooting NL6.NL, connection is established. / Colt reference : 0221689
384808	15/04 09:08	15/04 10:00	0:51	LF	None	Loss of Connectivity AT6-DE6 / No reason for outage / T-Systems trouble ticket : none
389370	05/05 00:21	05/05 13:47	13:26	LF	None	Loss of Connectivity SE6 - UK6 / Defective Optical amplifier / TELIA reference : none
383631	10/04 15:33	11/04 01:08	9:35	LF	T-systems 717911	Loss of Connectivity AT6 - HUNGARNET / Faulty circuit in Bratislava / T-Systems trouble ticket : 717911
381435	03/04 19:34	04/04 08:20	12:45	LF	T-systems 711093	Loss of Connectivity AT6 - CH6 / Faulty Telecom Device / T-Systems trouble ticket : 711093
383581	10/04 15:30	11/04 07:37	16:07	LF	T-systems 717763	Loss of Connectivity AT6 - DE6 / Major Backbone Outage in T-Systems Network / T-Systems trouble ticket : 717763
384816	15/04 09:09	16/04 09:58	0:48	LF	T-systems 721388	Loss of connectivity AT6 - CH6 / No reason for outage / T-Systems trouble ticket : 721388
385056	16/04 03:59	16/04 04:00	0:00	LF	T-systems 722093	Loss of Connectivity AT6 - DE6 / No reason fro outage / T-Systems trouble ticket : 722093
385443	17/04 07:55	17/04 08:10	0:15	LF	T-systems 723595	Loss of connectivity AT6 - DE6 / 2.5G between Munich - Salzburg down / T-Systems trouble ticket : 723595
386580	21/04 01:47	21/04 02:32	0:45	LF	T-systems 725270	Loss of Connectivity AT6 - DE6 / Optical Fiber damaged / T-Systems trouble ticket : 725270
388162	28/04 13:07	28/04 14:53	1:46	LF	T-systems 732025	Loss of connectivity AT6 - DE6 / RFO Broken cable / T-Systems trouble ticket : 732025
383193	30/04 23:00	01/05 00:30	1:30	LF	T-sytems 734203	Loss of connectivity AT6 - DE6 / Unscheduled Maintenance / T-Systems trouble ticket : 734203
384831	15/04 09:11	15/04 09:51	0:39	LF		Loss of Connectivity IT6 - GARR / Change of fiber on GARR side / GARR

Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
370744	28/02 16:52	29/04 09:00	16:08	RC	Cisco #D691510	Router configuration / 6PE Setup problem / Cisco case #D691510
378598	01/04 09:00	01/04 10:00	1:00	RC		Router configuration UK6 - JANET / BGP MD5 authentication configuration / 6NET NOC
378670	01/04 09:00	01/04 10:00	1:00	RC		Router configuration IT6 - GARR / BGP MD5 authentication configuration / 6NET NOC
380343	03/04 09:00	03/04 10:00	1:00	RC		Router configuration UK6 - NTT / BGP MD5 authentication configuration / 6NET NOC
384819	16/04 10:00	16/04 10:30	0:30	RC		Router configuration RENATER / Change of AS number - Restarting BGP Session / 6NET NOC
386472	22/04 08:56	22/04 16:00	7:04	RH		Unscheduled Maintenance CH6 / IPv4 unreachability / 6NET NOC
387396	25/04 09:00	25/04 11:00	2:00	RS		Router configuration UK61 / IOS Upgrade - image c7200-jk8s-mz.122-13.T / 6NET NOC
386604	27/04 03:30	27/04 06:00	2:30	SM	None	Scheduled maintenance AT6 - DE6 / Not provided / T-Systems trouble ticket : none
386605	27/04 06:00	27/04 07:30	1:30	SM	None	Scheduled maintenance AT6 - HUNGARNET / Not Provided / T-Systems trouble ticket : none
386607	27/04 03:30	27/04 06:00	2:30	SM	None	Scheduled maintenance DE6 - CESNET / Not Provided / T-Systems trouble ticket : none
383200	29/04 01:00	29/04 06:00	5:00	SM	TELIA NMCP6720	Scheduled Maintenance DE6 - SE6 / Done / TELIA trouble ticket : NMCP6720
382283	24/04 01:02	24/04 06:32	5:30	SM	TELIA NMCP6723	Scheduled Maintenance SE6 - UK6 / Done / TELIA reference : NMCP6723
383198	26/04 01:00	26/04 06:00	5:00	SM	TELIA NMCP6726	Scheduled Maintenance SE6 - UK6 / Done / TELIA reference : NMCP6726
378667	15/04 01:00	15/04 07:48	6:48	SM	TELIA NMCP7369	Scheduled Maintenance 6NET - SE - UK / Not Provided / TELIA reference : NMCP7369
379435	06/04 00:00	06/04 01:00	1:00	SM	TELIA NMCP7374	Scheduled Maintenance DE6 - SE6 / No Outage w as noted / TELIA reference : NMCP7374
383193	30/04 23:00	01/05 00:30	1:30	SM	TELIA NMCP7564	Scheduled Maintenance SE6 - UK6 / Done / TELIA reference : NMCP7564
383886	18/04 01:00	18/04 01:30	0:30	SM	T-systems 726344	Scheduled maintenance AT6 - HUNGARNET / Maintenance occurred / T-Systems 726344
378172	01/04 01:00	01/04 01:00	0:00	SM	None	Scheduled outage AT6 - DE6 / No Outage w as noted / T-Systems trouble ticket : none
378175	05/04 03:00	05/04 03:00	0:00	SM	None	Scheduled outage AT6 - HUNGARNET / No outage w as noted / Tsystem trouble ticket : none
378180	05/04 03:00	05/04 03:00	0:00	SM	None	Scheduled outage AT6 - DE6 / No outage w as noted / T-Systems trouble ticket : none
378191	06/04 03:00	06/04 03:00	0:00	SM	None	Scheduled outage AT6 - DE6 / No outage w as noted / T-Systems trouble ticket : none
378197	06/04 03:00	06/04 03:00	0:00	SM	None	Scheduled outage AT6 - CH6 / No outage w as noted / T-Systems trouble ticket : none
378208	12/04 02:00	12/04 02:00	0:00	SM	None	Scheduled outage AT6 - HUNGARNET / No outage w as noted / T-Systems trouble ticket : none
379120	13/04 03:00	13/04 03:00	0:00	SM	None	Scheduled maintenance AT6 - CH6 / No outage w as noted / T-Systems trouble ticket : none
379127	13/04 02:00	13/04 02:00	0:00	SM	None	Scheduled outage AT6 - HUNGARNET / No outage w as noted / T-Systems trouble ticket : none

Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
386611	05/05 04:20	05/05 04:20	0:00	SM	T-Systems	Scheduled maintenance 6NET AT6 - DE6 / Did not occur / T - System
386612	05/05 04:20	05/05 04:20	0:00	SM	T-Systems	Scheduled maintenance AT6 - HUNGARnet / Did not occur / T - System
386615	05/05 04:20	05/05 04:20	0:00	SM	T-Systems	Scheduled maintenance DE6 - CESnet / Did not occur / T - Systems
389196	06/05 03:00	06/05 03:00	0:00	SM	T-Systems	Scheduled Maintenance AT6 - DE6 / Did not occur / T-Systems
390314	15/05 23:00	15/05 23:00	0:00	SM	T-Systems	Scheduled maintenance AT6 - DE6 / Did not occur / T-Systems
390315	15/05 23:00	15/05 23:00	0:00	SM	T-Systems	Scheduled Maintenance AT6 - HUNGARnet / Did not occur / T-systems
390669	16/05 00:00	16/05 00:00	0:00	SM	TELIA NMCP 7800	Scheduled maintenance SE6 - UK6 / Cancelled / TELIA
393161	17/05 00:00	17/05 00:00	0:00	SM	TELIA NMCP 7800	Scheduled maintenance SE6 - UK6 / Cancelled / TELIA
393676	23/05 01:00	23/05 09:00	8:00	SM	TELIA NMCP 7900	Scheduled Maintenance 6net SE-UK / Done / Telia Reference : NMCP 7900
390935	10/05 10:15	10/05 12:15	2:00	RC		Router configuration All 6NET routers / IOS upgrade / 6NET NOC
389370	05/05 00:21	05/05 00:32	0:11	LF	TELIA none	Loss of Connectivity SE6 - UK6 / Defective Optical amplifier / TELIA
394656	21/05 14:29	22/05 03:25	12:56	LF	TELIA 5069011	Loss of Connectivity SE6 - UK6 / Cable problem / TELIA
396305	26/05 00:45	26/05 01:14	0:29	LF	TELIA 5083314	Loss of Connectivity SE6 - UK6 / Faulty card replaced / TELIA

Géant NOC Ticket No	Problem Start <i>d/m h:m:s</i>	Problem End <i>d/m h:m:s</i>	Duration <i>h:m</i>	Class	Fixer Ticket No	Summary
399773	25/06 00:00	25/06 00:00	00:00	SM	T-Systems	Scheduled Maintenance AT6 - HUNGARnet / Maintenance did not occur
405913	24/06 03:00	24/06 05:05	02:05	SM	T-Systems	Scheduled Maintenance AT6 - CH6 / Maintenance occurred
397862	23/06 00:00	23/06 00:00	00:00	SM	TELIA NMCP8021	Scheduled Maintenance SE6 - UK6 / Maintenance did not occur
398427	01/06 14:56	02/06 00:26	09:30	LF	T-Systems 768489	Loss of Connectivity AT6 - CH6 / Cable cut between Basel - Stuttgart
402810	15/06 10:55	15/06 12:44	01:49	LF	T-Systems 785466	Loss of Connectivity AT6 - DE6 / No reason for outage
401774	11/06 02:59	11/06 05:59	03:00	LF	T-Systems 781223	Loss of Connectivity AT6 - DE6 / Unscheduled maintenance
398700	02/06 08:55	02/06 15:19	06:24	LF	T-Systems 769533	Loss of Connectivity AT6 - DE6 / Major outage in Hungary, circuit re-routed
404188	18/06 09:02	18/06 20:45	11:43	LF	TELIA 5190437	Loss of Connectivity DE6 - SE6 / Faulty fiber in Denmark has been replaced
396305	24/05 00:45	24/05 01:14	00:29	LF	TELIA 5083314	Loss of Connectivity SE6 - UK6 / Faulty card replaced
399947	05/06 09:00	05/06 11:00	02:00	SM	6NET NOC	Scheduled Maintenance 6NET backbone routers / IOS upgraded
398964	05/06 07:00	05/06 13:30	06:30	SM	6NET NOC	Scheduled Maintenance NL6.NL router / Maintenance occurred
399746	25/06 00:00	25/06 00:00	00:00	SM	T-Systems	Scheduled Maintenance DE6 - CESnet / Maintenance did not occur
399762	25/06 00:00	25/06 00:00	00:00	SM	T-Systems	Scheduled Maintenance AT6 - DE6 / Maintenance did not occur
399773	25/06 00:00	25/06 00:00	00:00	SM	T-Systems	Scheduled Maintenance AT6 - HUNGARnet / Maintenance did not occur
405913	24/06 03:00	24/06 05:05	02:05	SM	T-Systems	Scheduled Maintenance AT6 - CH6 / Maintenance occurred
397862	23/06 00:00	23/06 00:00	00:00	SM	TELIA NMCP8021	Scheduled Maintenance SE6 - UK6 / Maintenance did not occur
397861	23/06 00:00	23/06 00:00	00:00	SM	TELIA NMCP8021	Scheduled Maintenance DE6 - SE6 / Maintenance did not occur
400678	17/06 18:00	17/06 18:52	00:52	SM	TELIA NMCP8121	Scheduled Maintenance SE6 - UK6 / Maintenance occurred

4.2. TROUBLE TICKETS REPARTITION



#### 4.3. AVAILABILITY

NRENs	Scheduled	Unscheduled	Availability	Average Availability
	<i>Hour(s) Out</i>	<i>Hour(s) Out</i>	<i>31 days covered</i>	<i>(last 12 months)</i>
ACONET		0:15	99.97%	99.77%
CESNET		0:15	99.97%	100.00%
DFN		0:15	99.97%	100.00%
GARR		00:15	99.97%	100.00%
GRNET		0:15	99.97%	100.00%
HUNGARnet		0:15	99.97%	100.00%
JANET/UKERNA		0:15	99.97%	100.00%
NORDUNET		0:15	99.97%	99.98%
NTT		0:15	99.97%	100.00%
POZNAN		0:15	100.00%	100.00%
PSNC		0:15	99.97%	100.00%
PSNC 2		0:15	99.97%	100.00%
RENATER		0:15	99.97%	99.95%
SURFNET 1		6:15	99.16%	100.00%
SURFNET 2		6:15	99.16%	100.00%
SWITCH (CERN)		0:15	99.97%	100.00%

Trunks	Scheduled	Unscheduled	Availability	Average Availability
	<i>Hour(s) Out</i>	<i>Hour(s) Out</i>	<i>31 days covered</i>	<i>(last 12 months)</i>
AT ↔ CH	2:05	9:30	98.72%	99.96%
AT ↔ DE		11:13	98.49%	99.87%
CH ↔ FR			100.00%	100.00%
CH ↔ IT			100.00%	100.00%
DE ↔ GR			100.00%	100.00%
DE ↔ IT			100.00%	100.00%
DE ↔ NL			100.00%	100.00%
DE ↔ SE		11:43	98.43%	99.91%
FR ↔ UK			100.00%	99.99%
NL ↔ UK			100.00%	99.97%
SE ↔ UK	0:52	0:29	99.93%	99.81%
UK ↔ UK61			100.00%	100.00%

## 5. PERFORMANCE REPORT

### 5.1. ACCESS PORTS

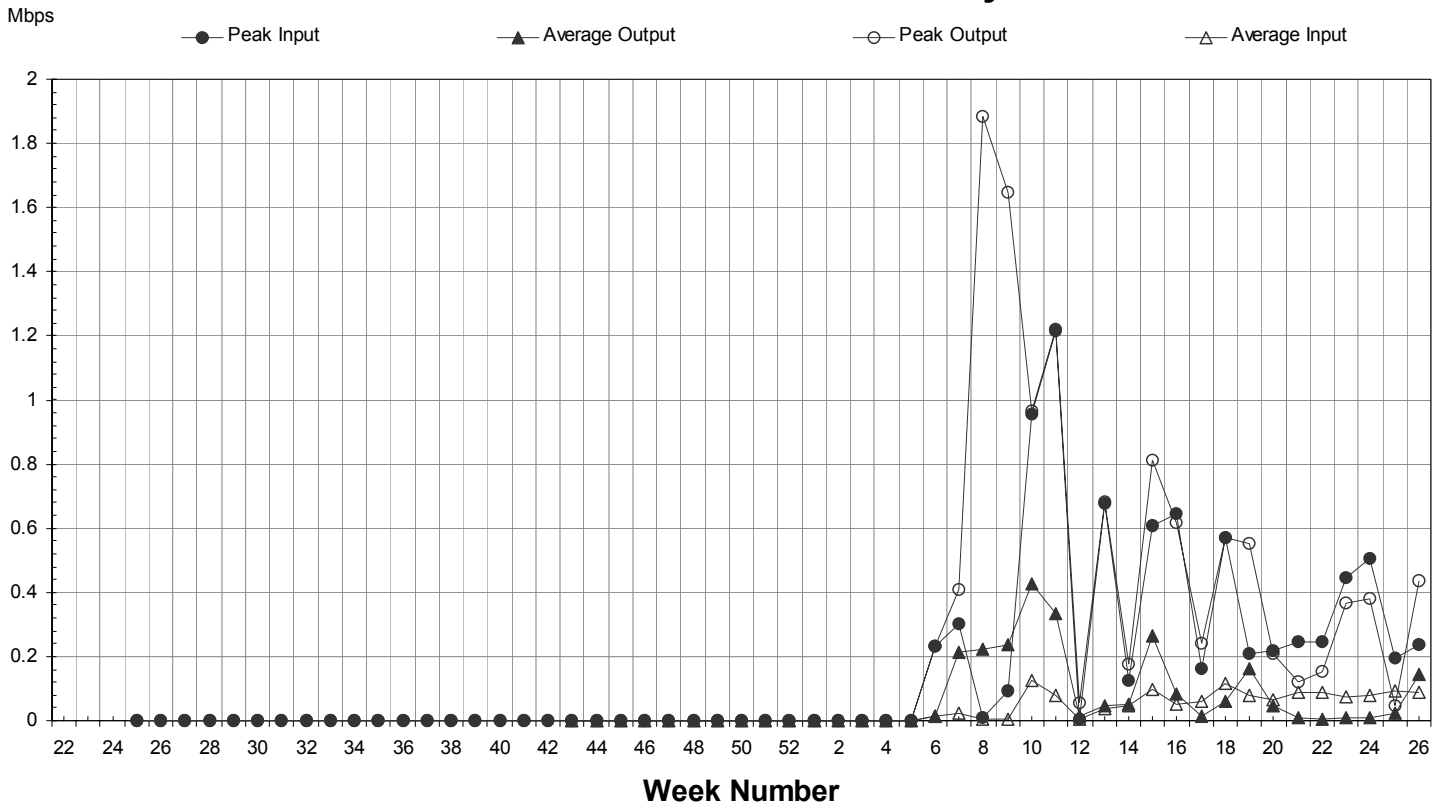
This section contains the traffic data for the NREN Accesses.

The legend is:

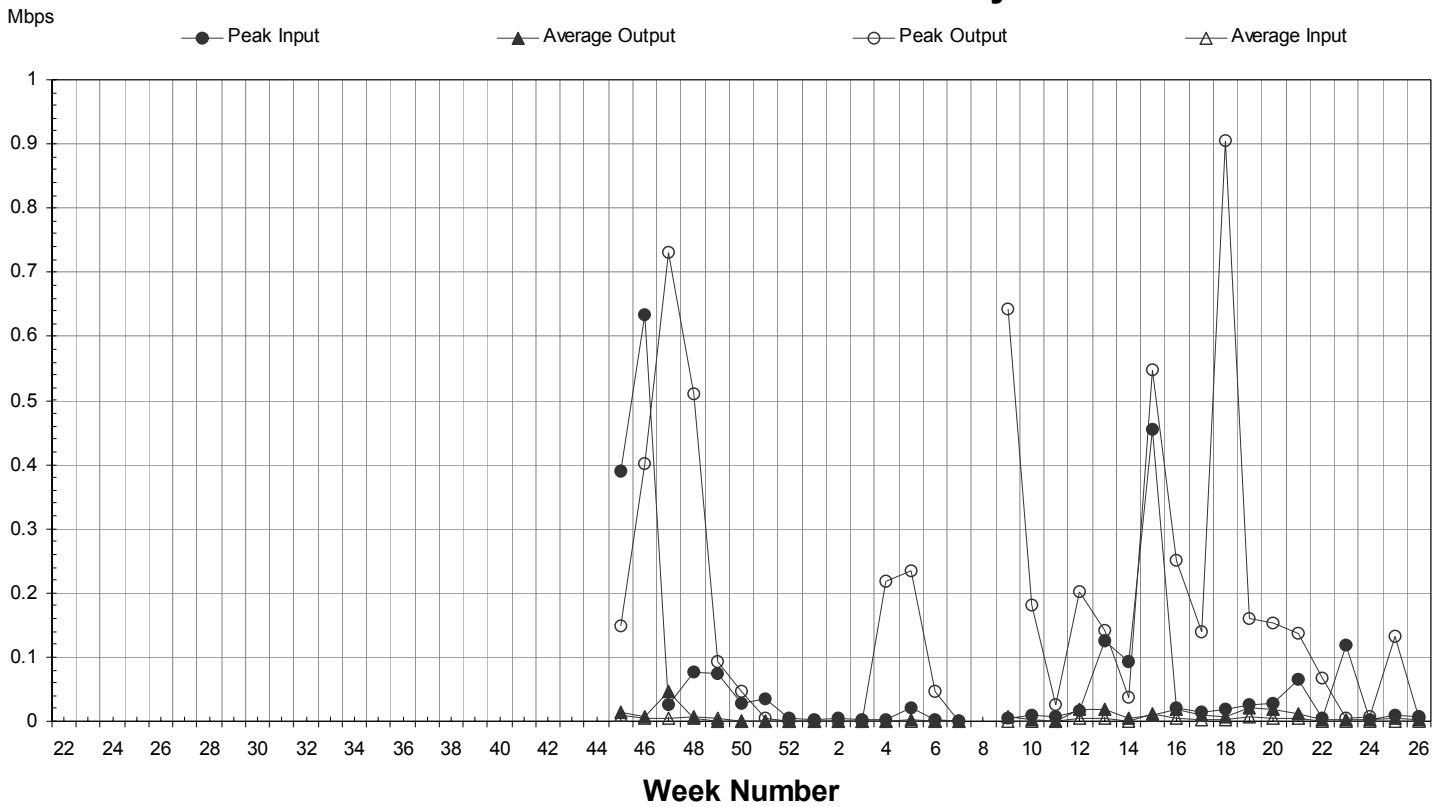
- Average Input
- ▲— Peak Input
- Average Output
- △— Peak Output



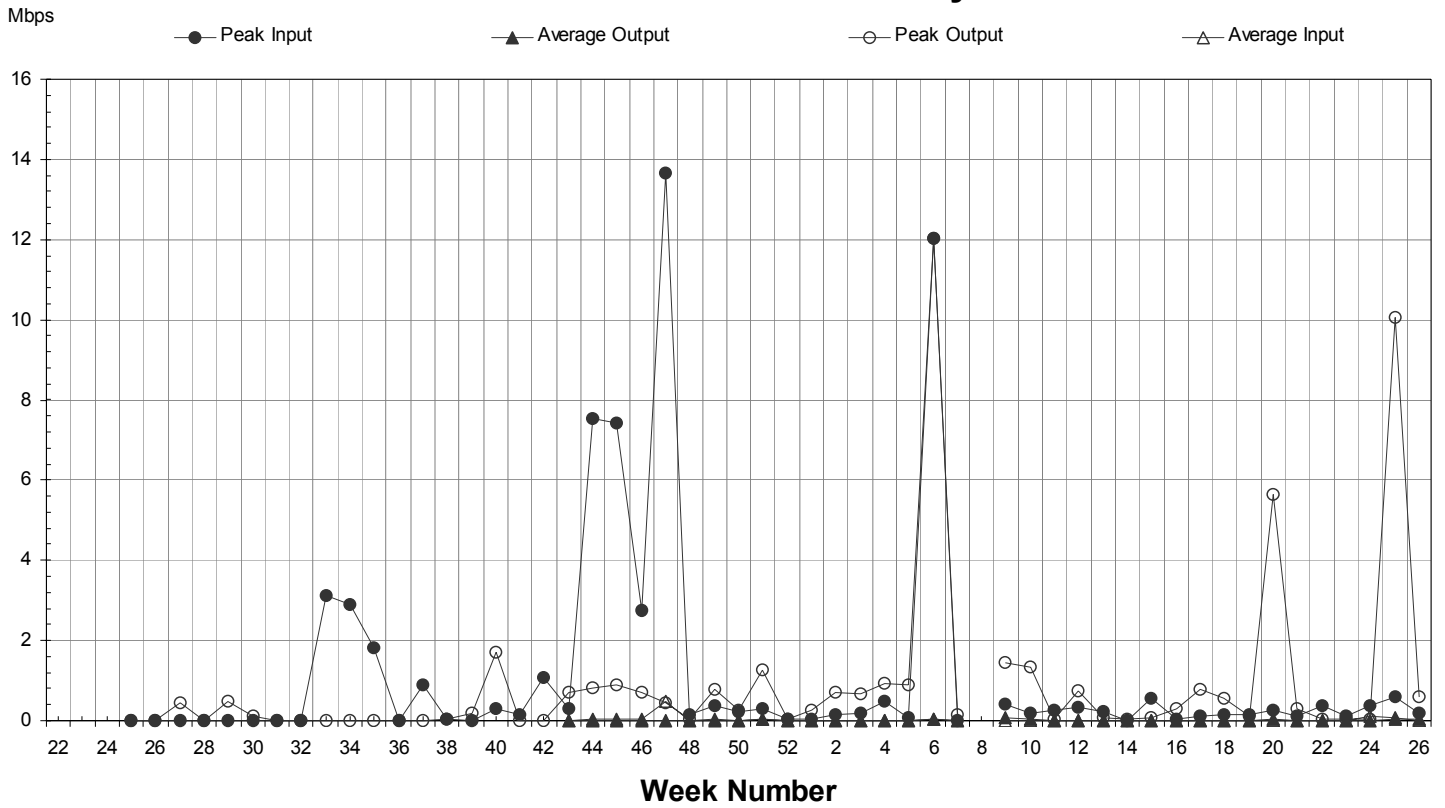
### ACOnet 6NET Access History



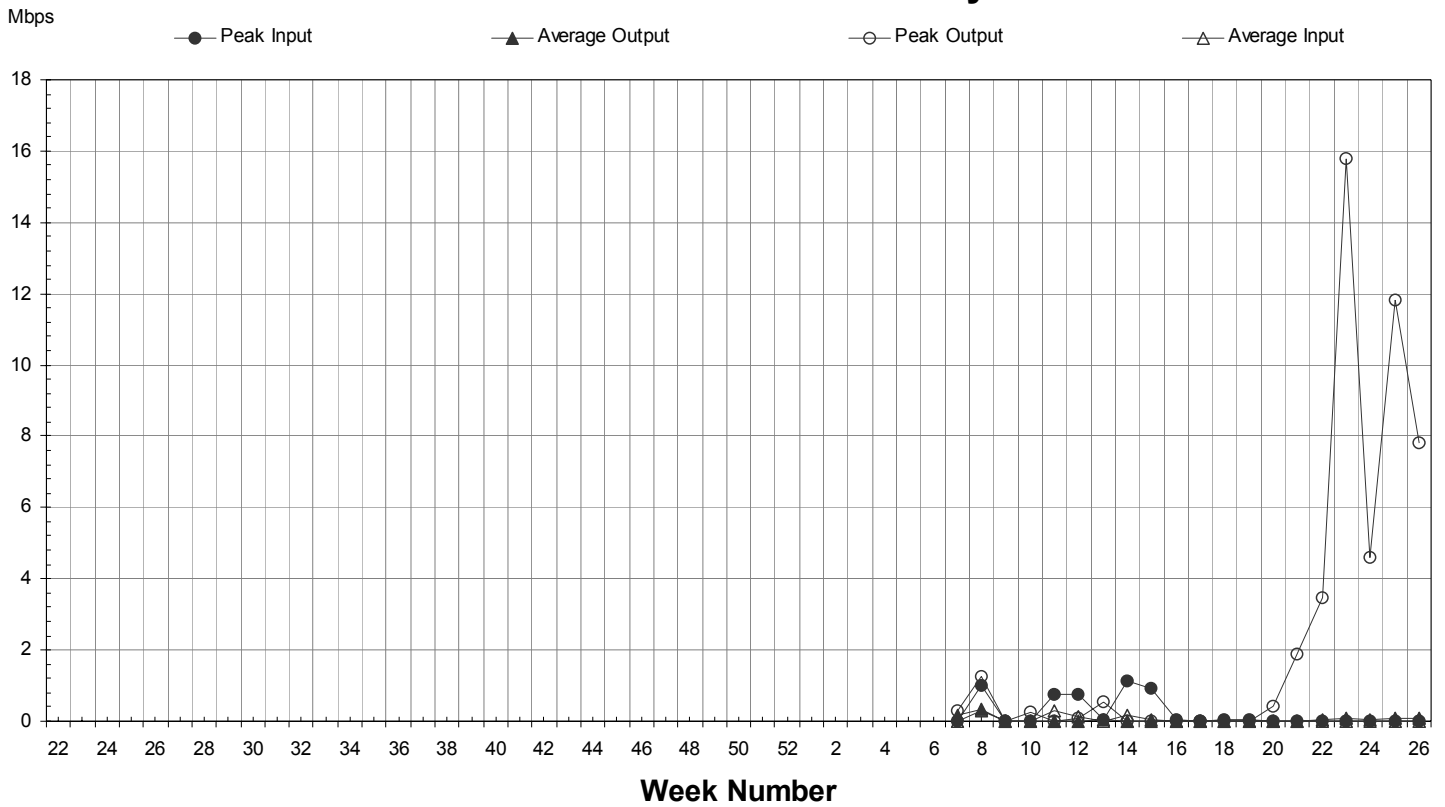
### CESNET 6NET Access History



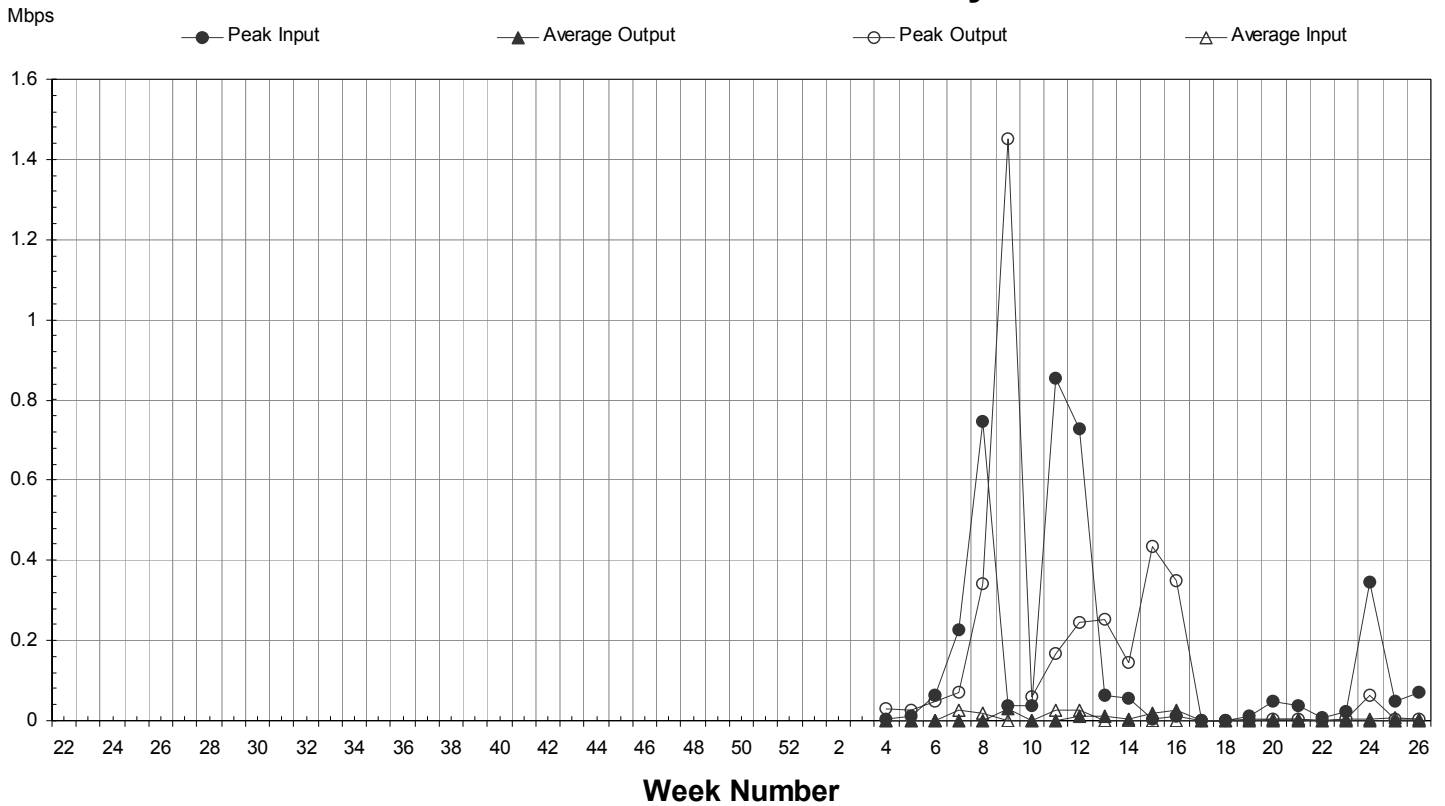
### DFN 6NET Access History



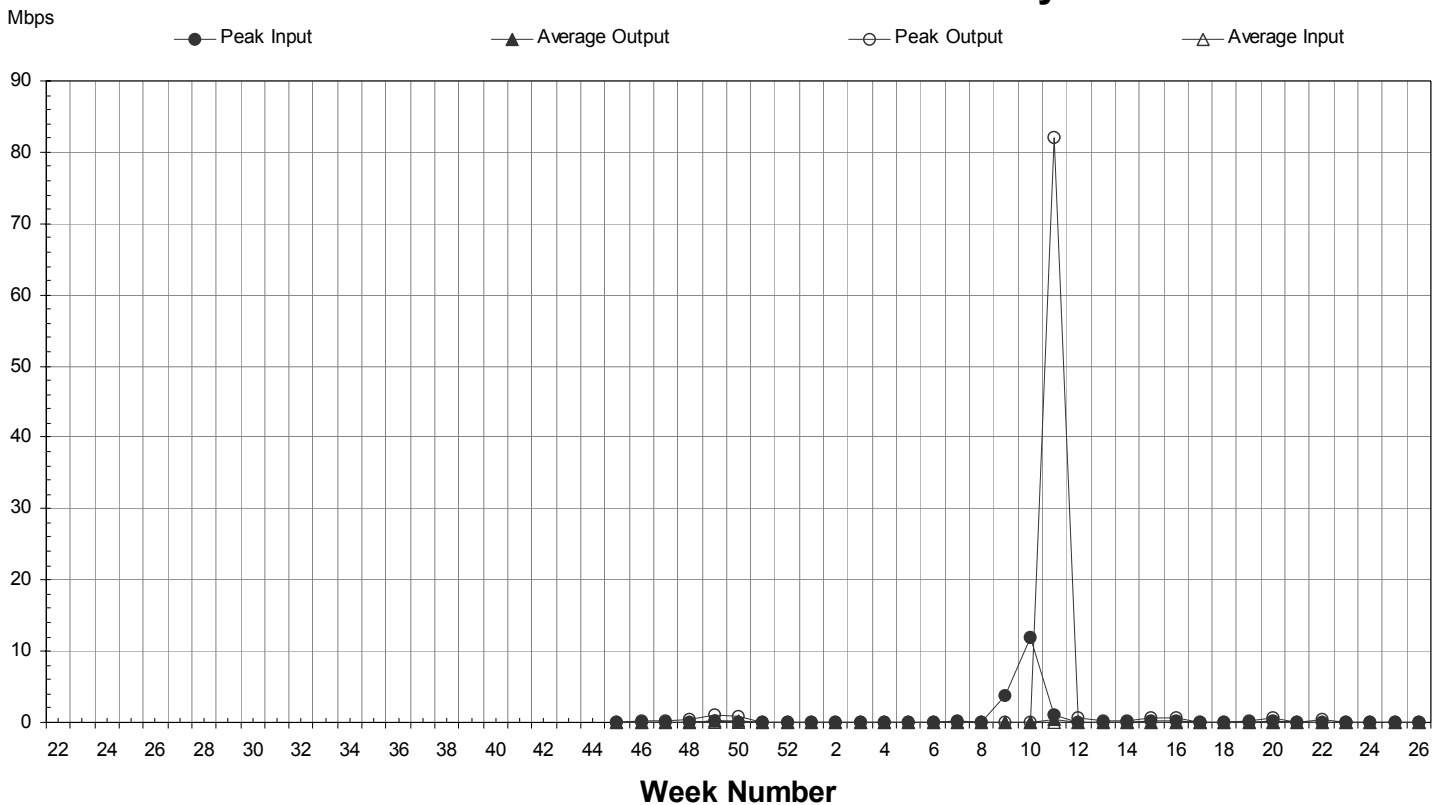
### GARR 6NET Access History



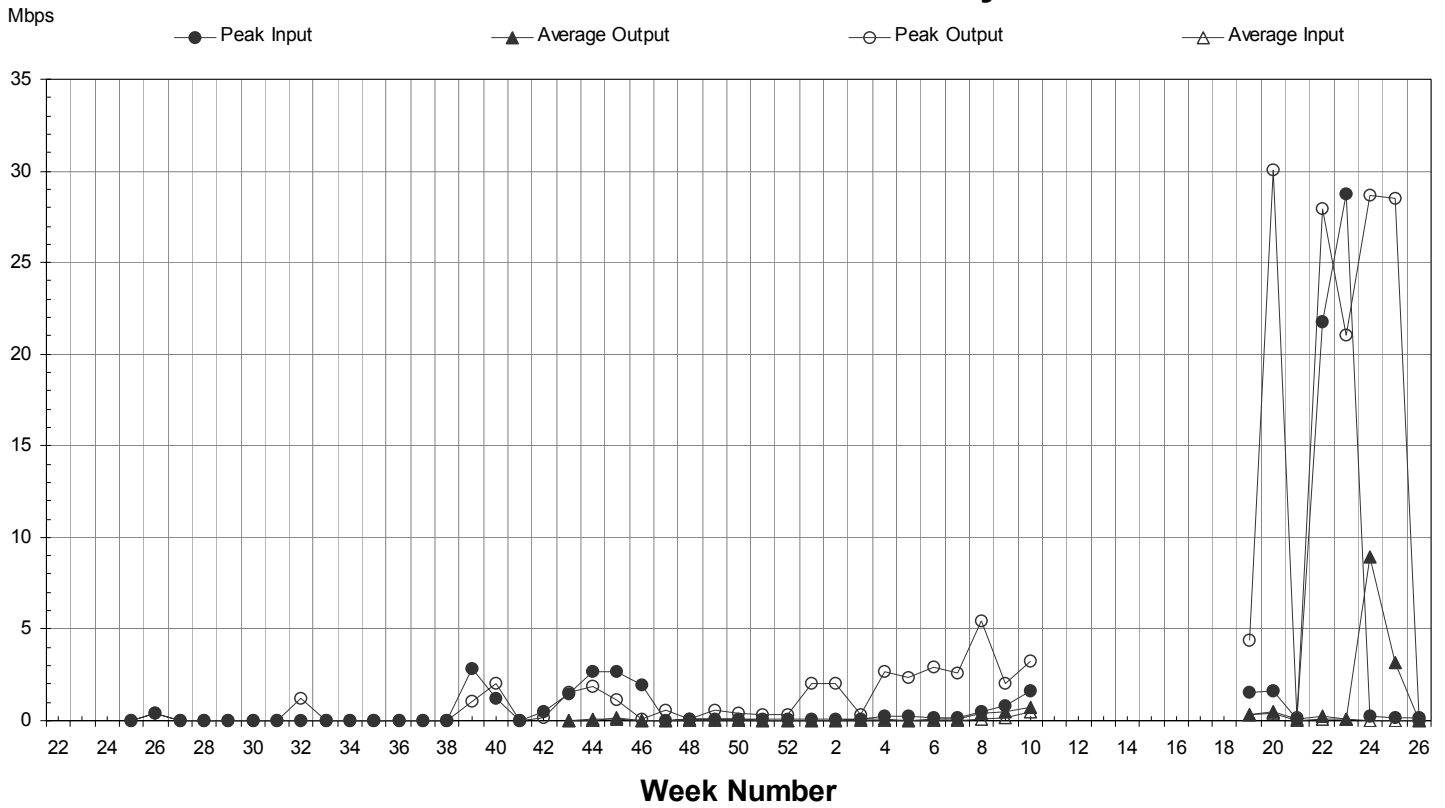
### GRnet 6NET Access History



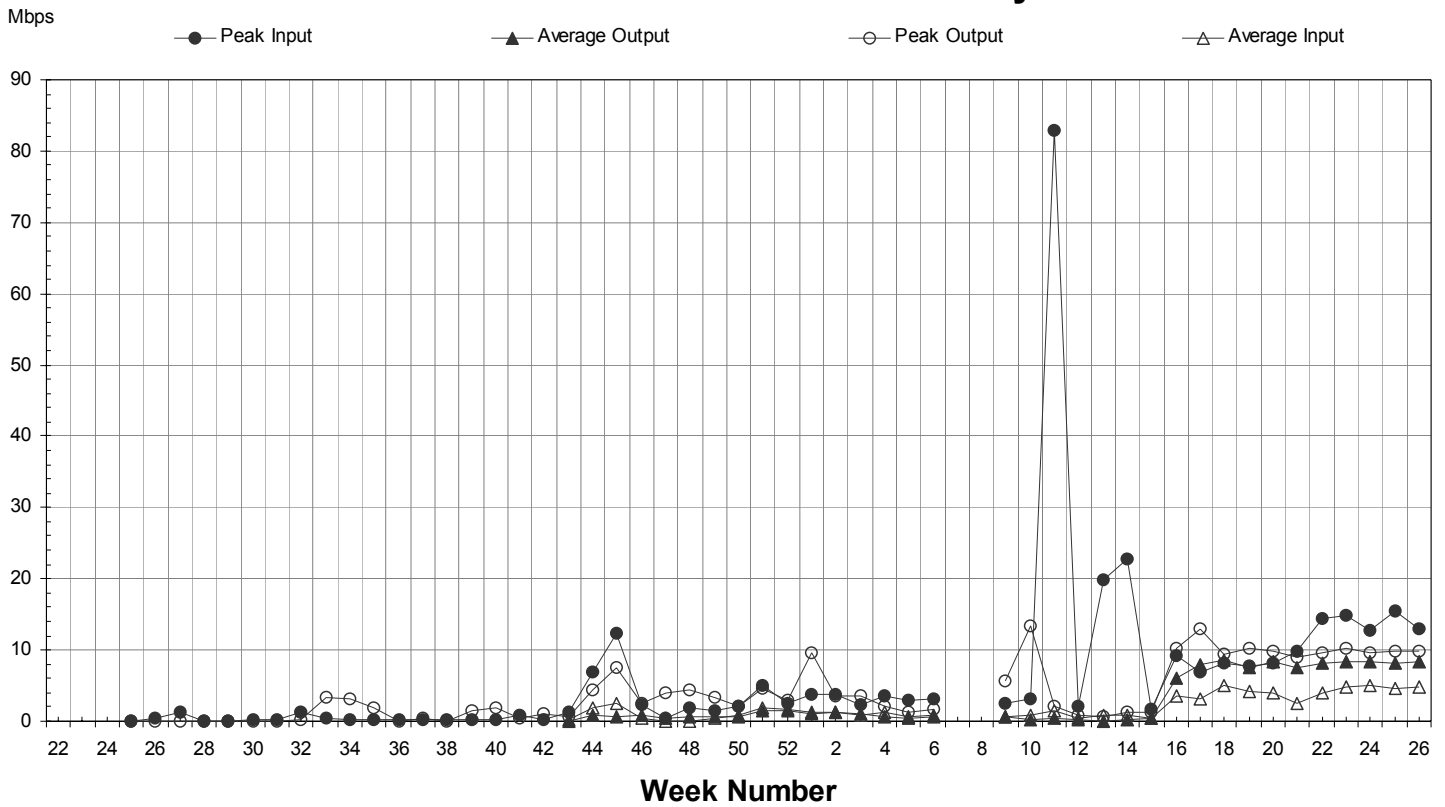
### HUNGARNET 6NET Access History



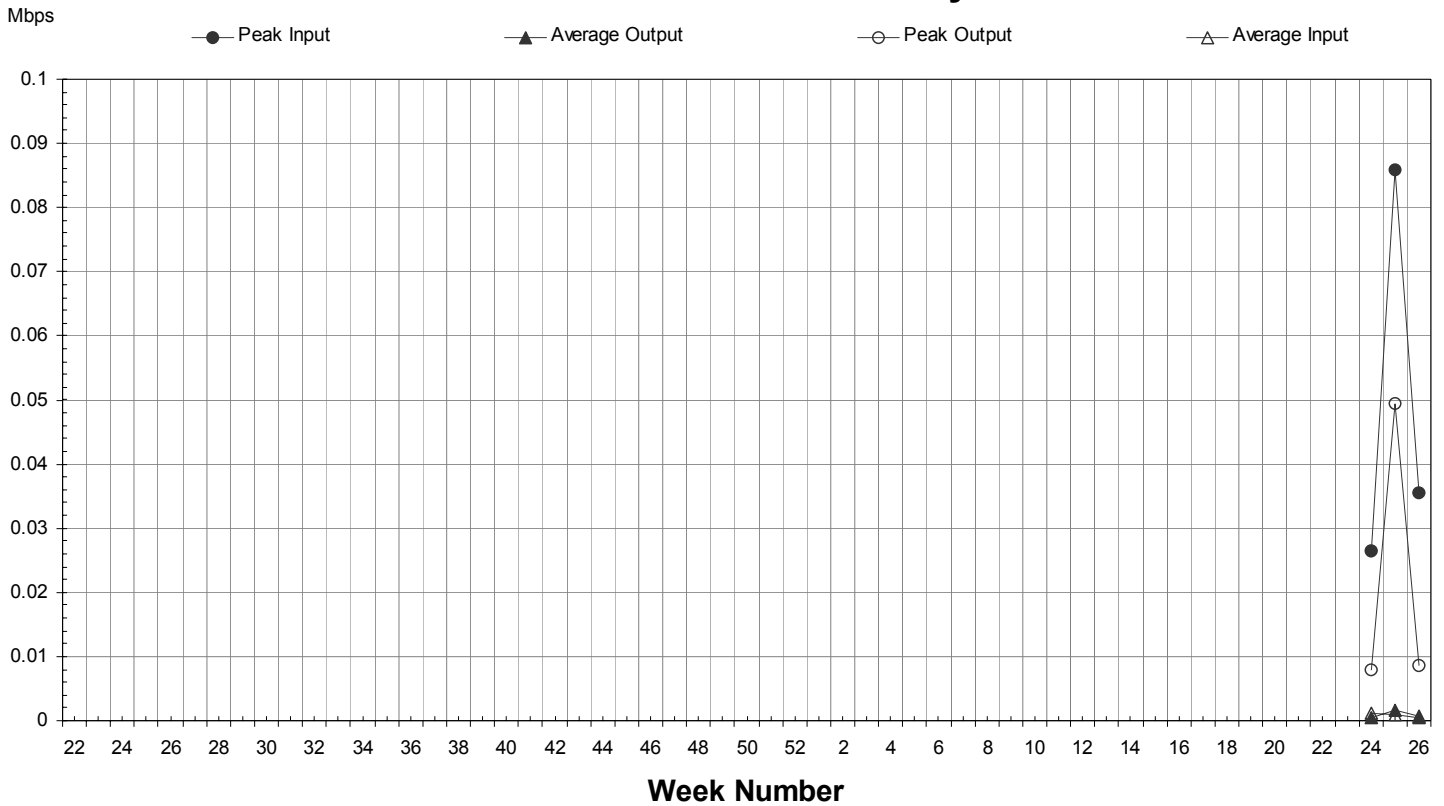
### JANET 6NET Access History



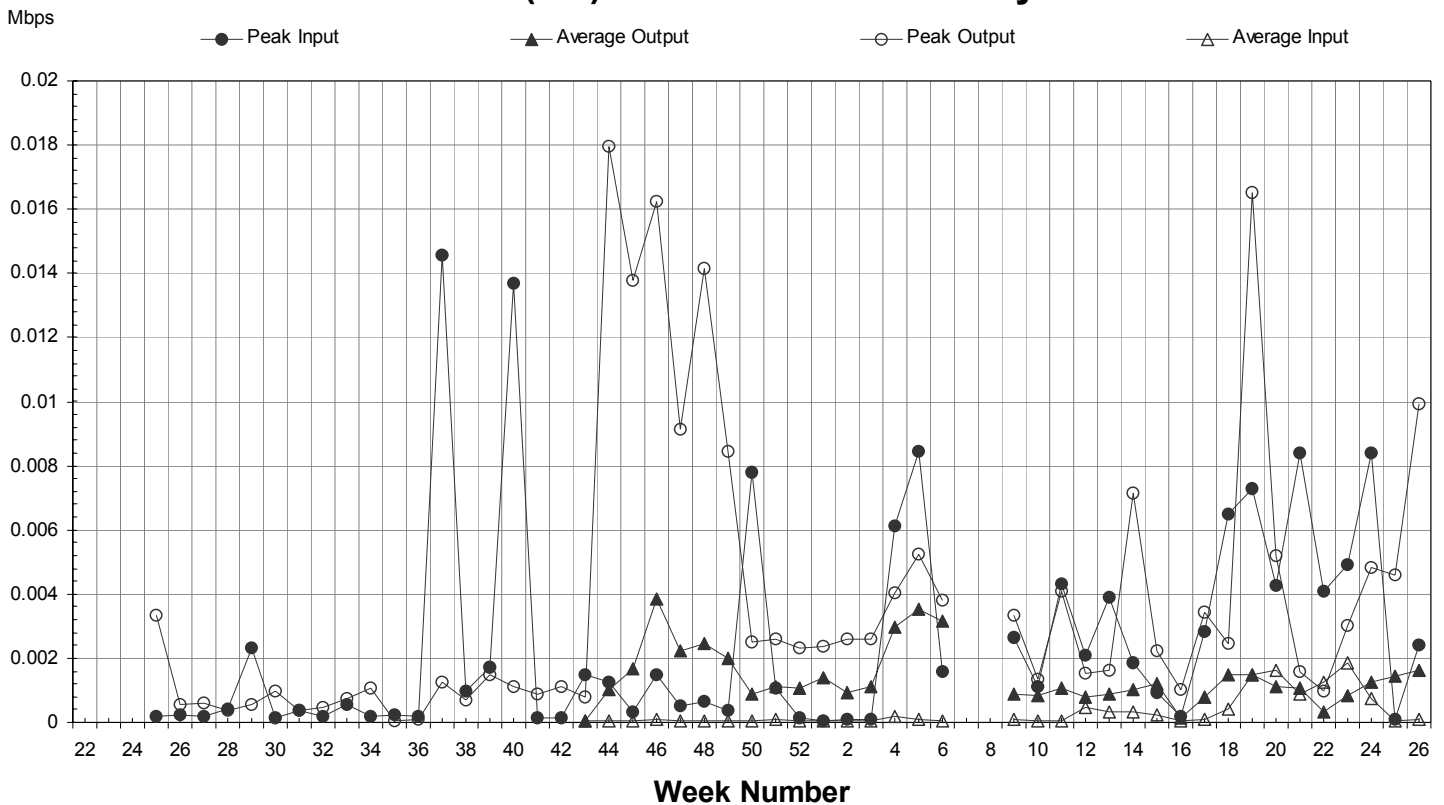
### NORDUnet 6NET Access History



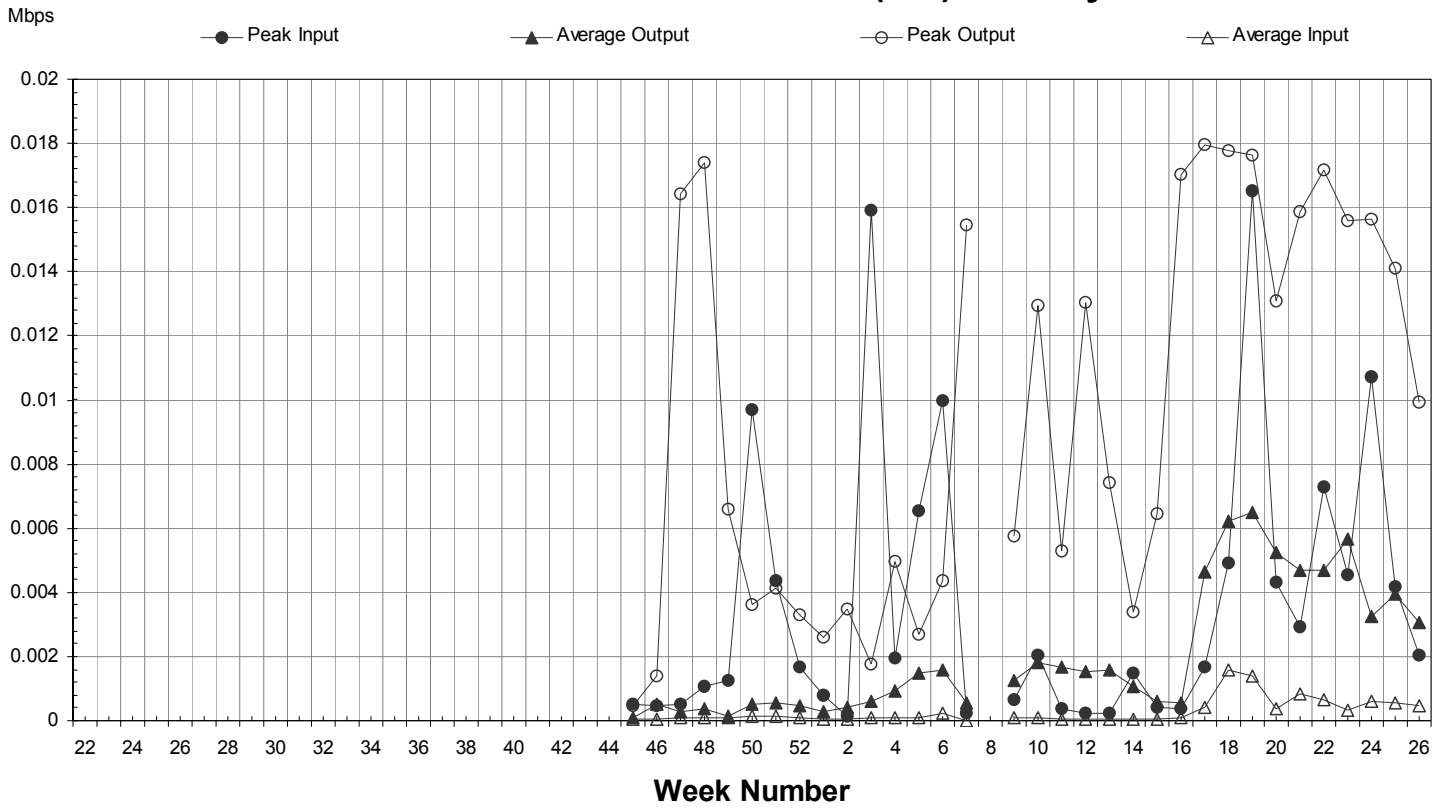
### NTT 6NET Access History



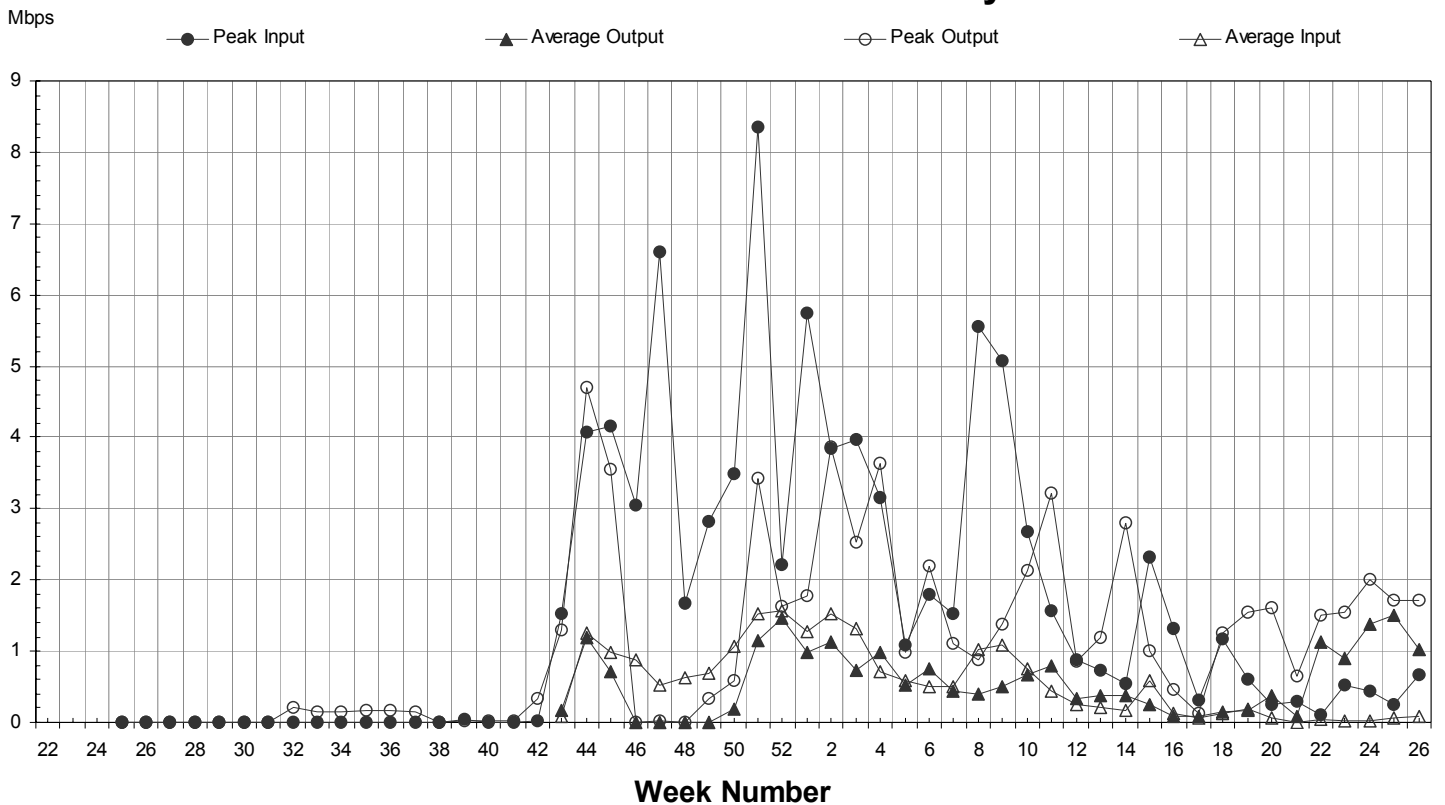
### PSNC (SE) 6NET Access History



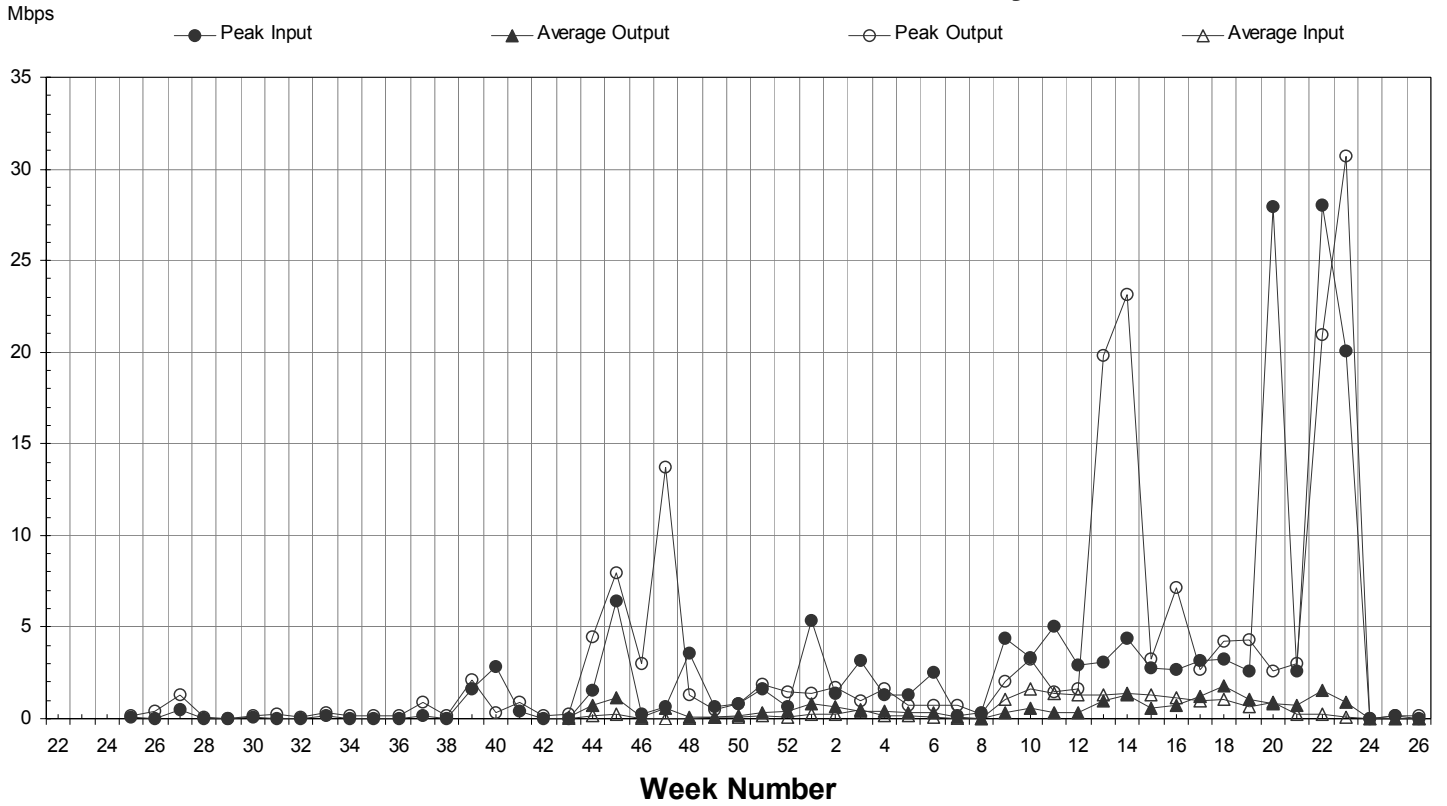
### PSNC 6NET Tunnel Access (DE) History



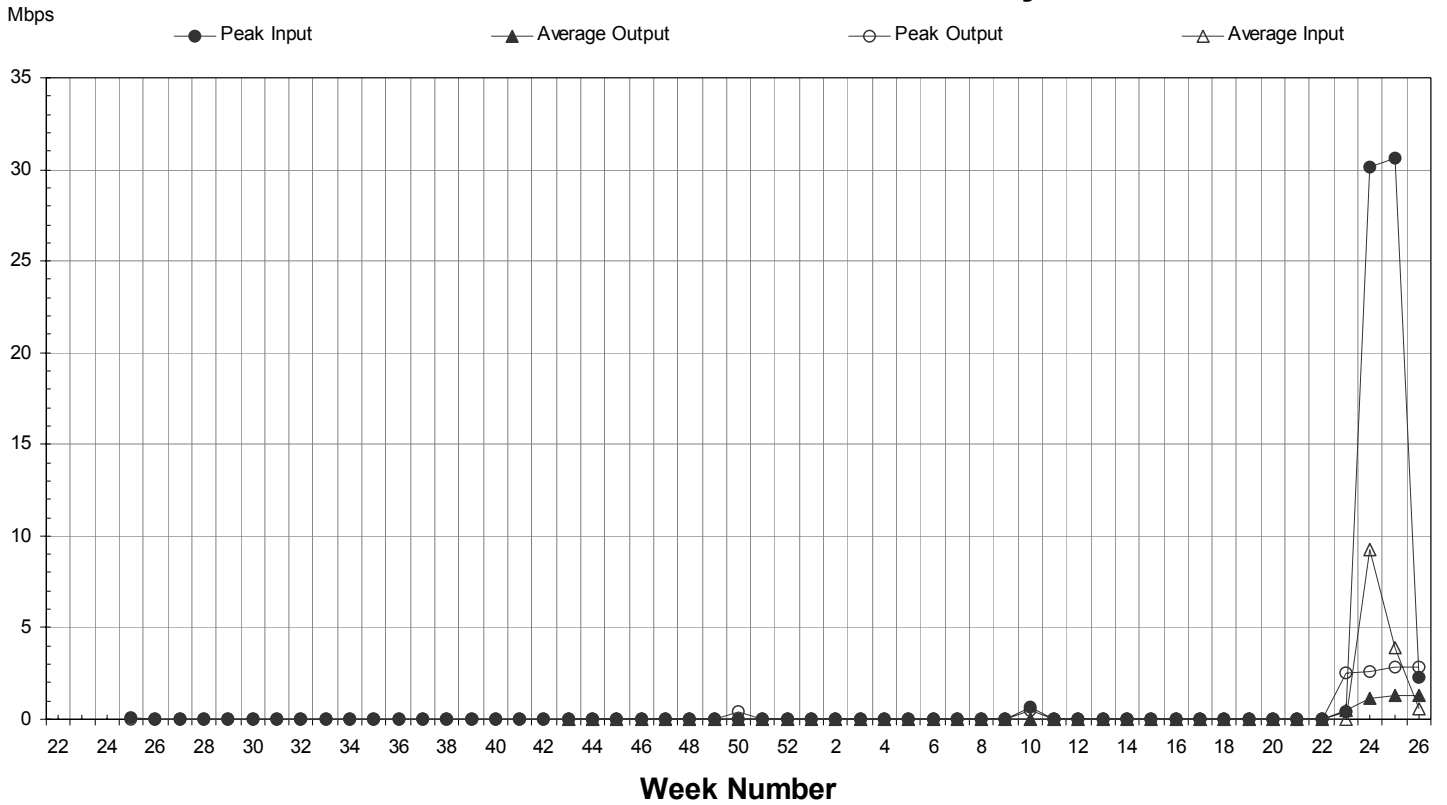
### Renater 6NET Access History



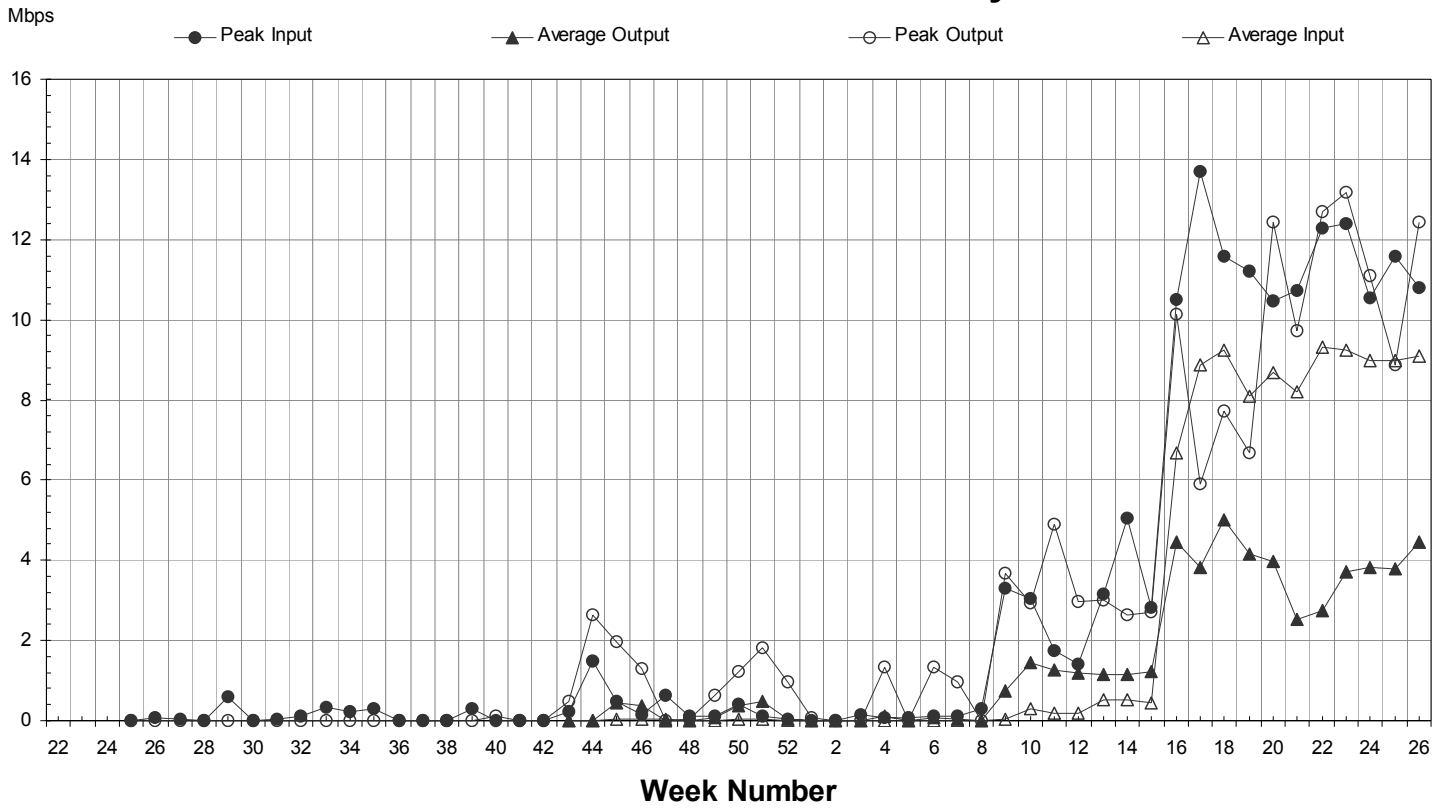
### SURFnet 6NET Access 1 History



### SURFNET 6NET Access 2 History



### SWITCH 6NET Access History





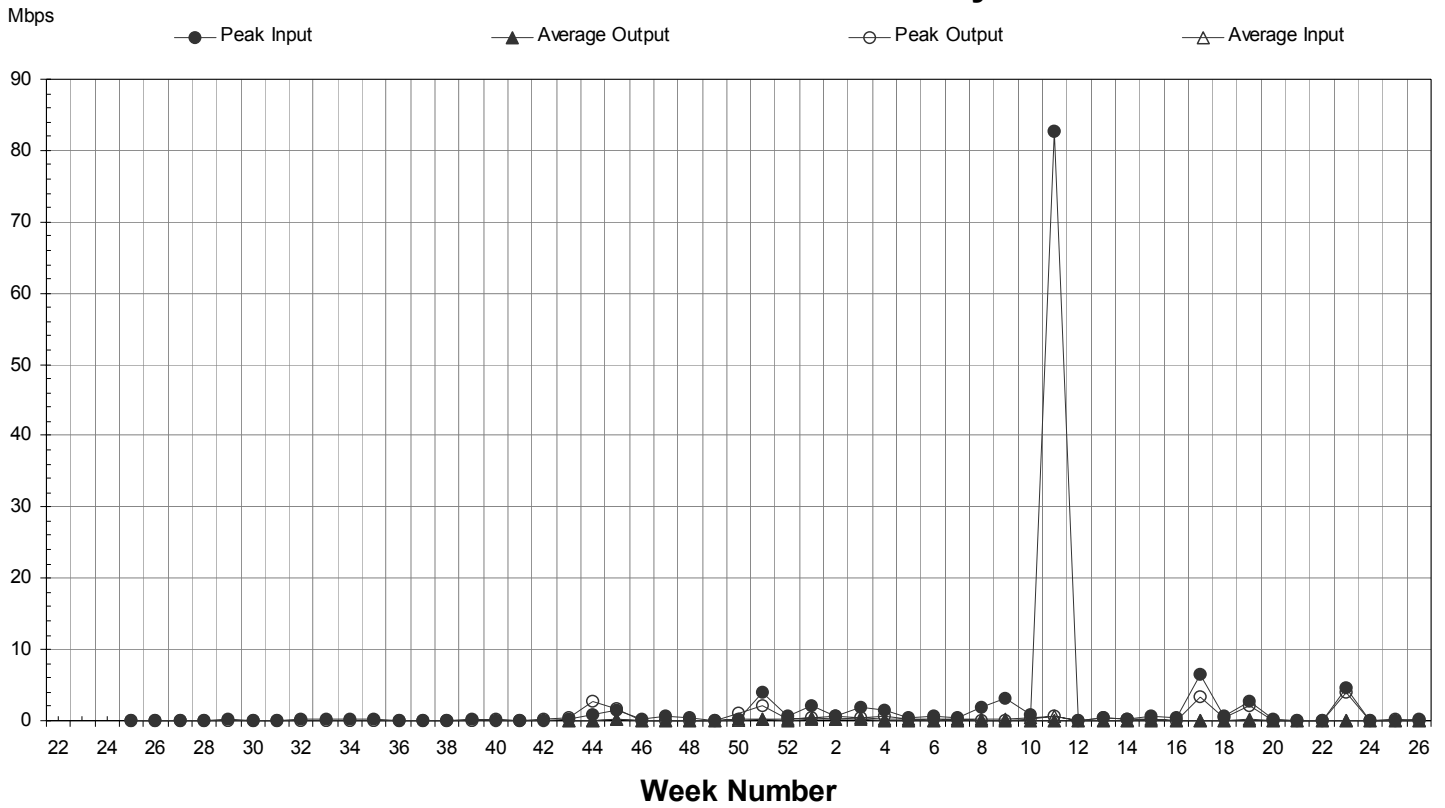
## 5.2. BACKBONE TRAFFIC

This section contains the traffic data for the backbone trunks.

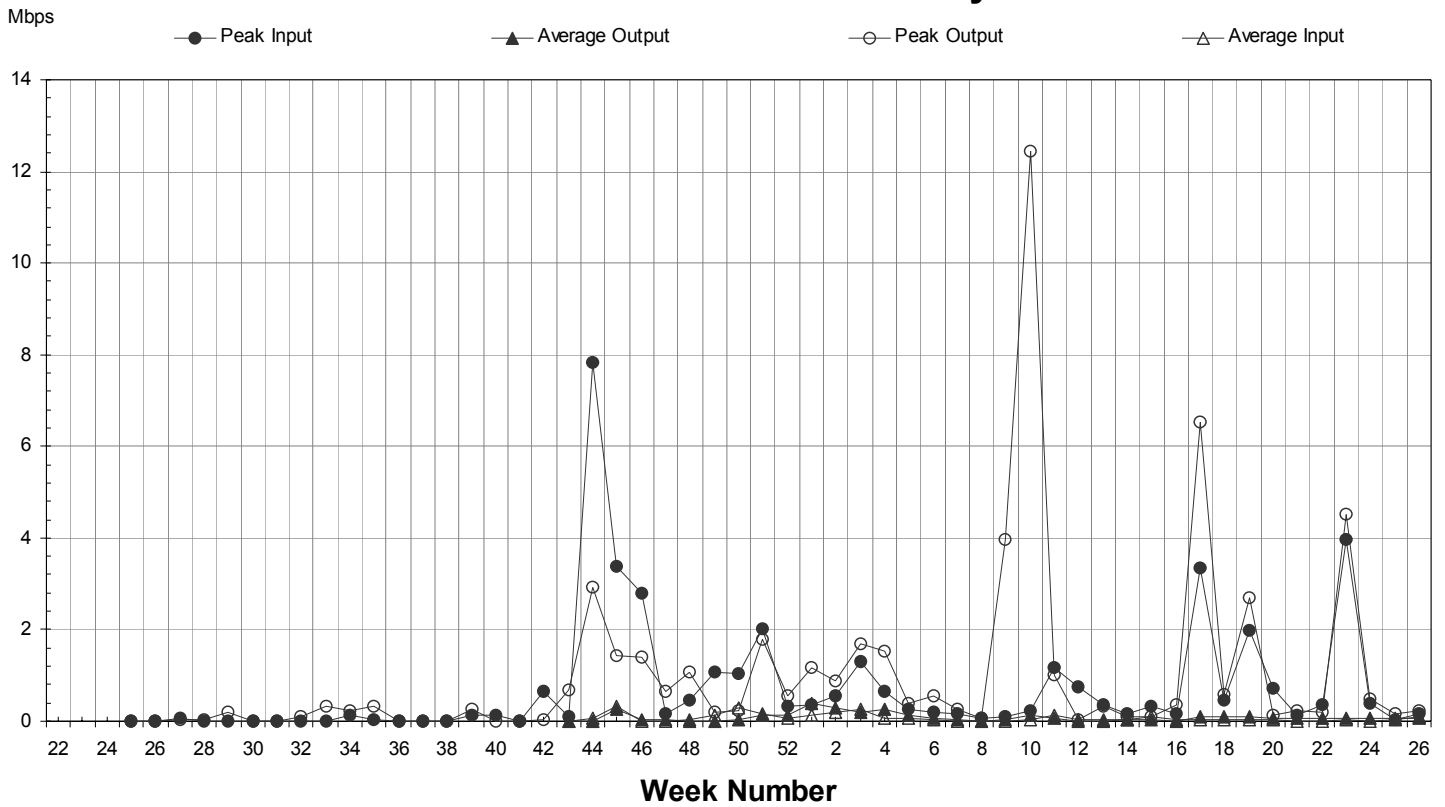
The legend is:

- Average Input
- ▲— Peak Input
- Average Output
- △— Peak Output

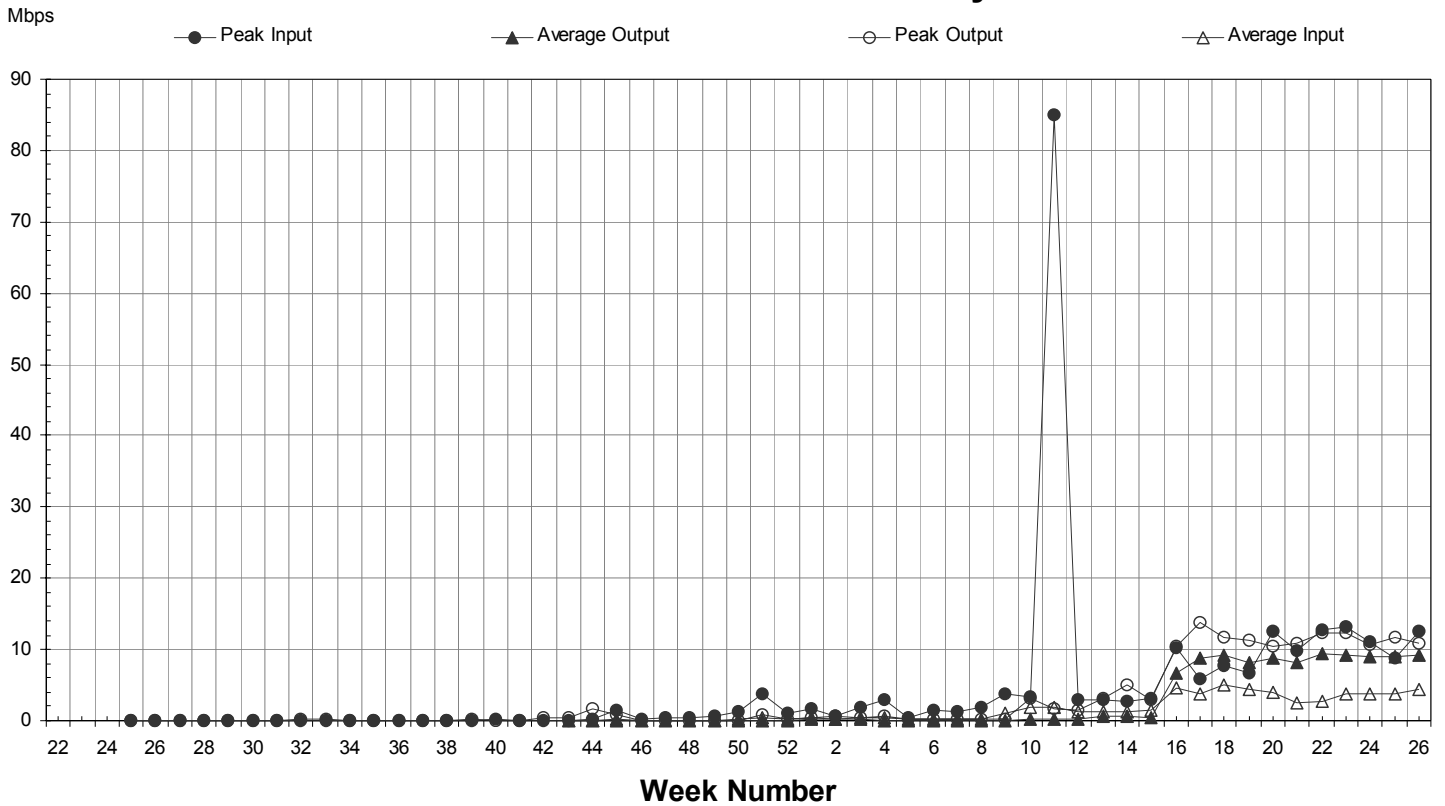
### AT - CH 6NET Trunk History



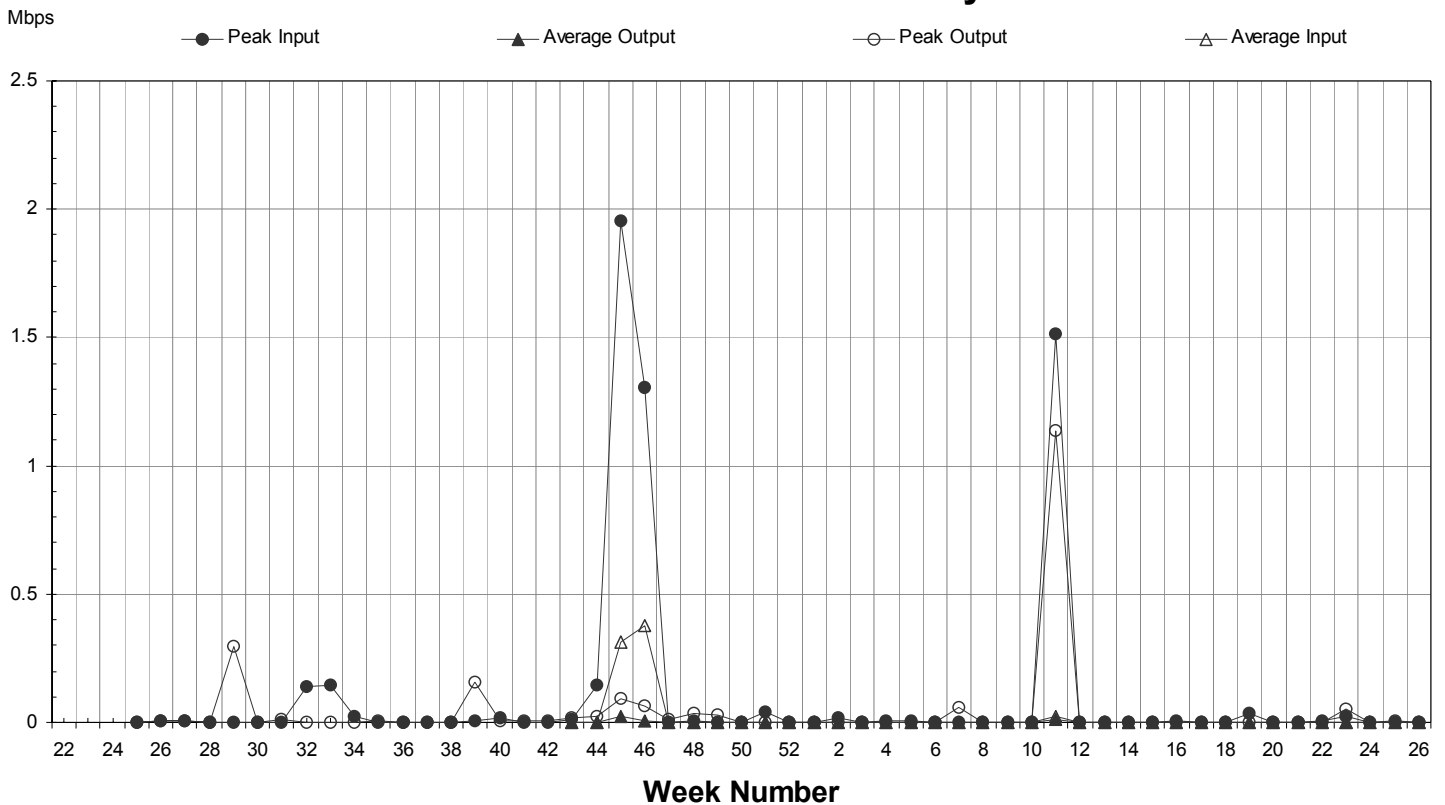
### AT - DE 6NET Trunk History



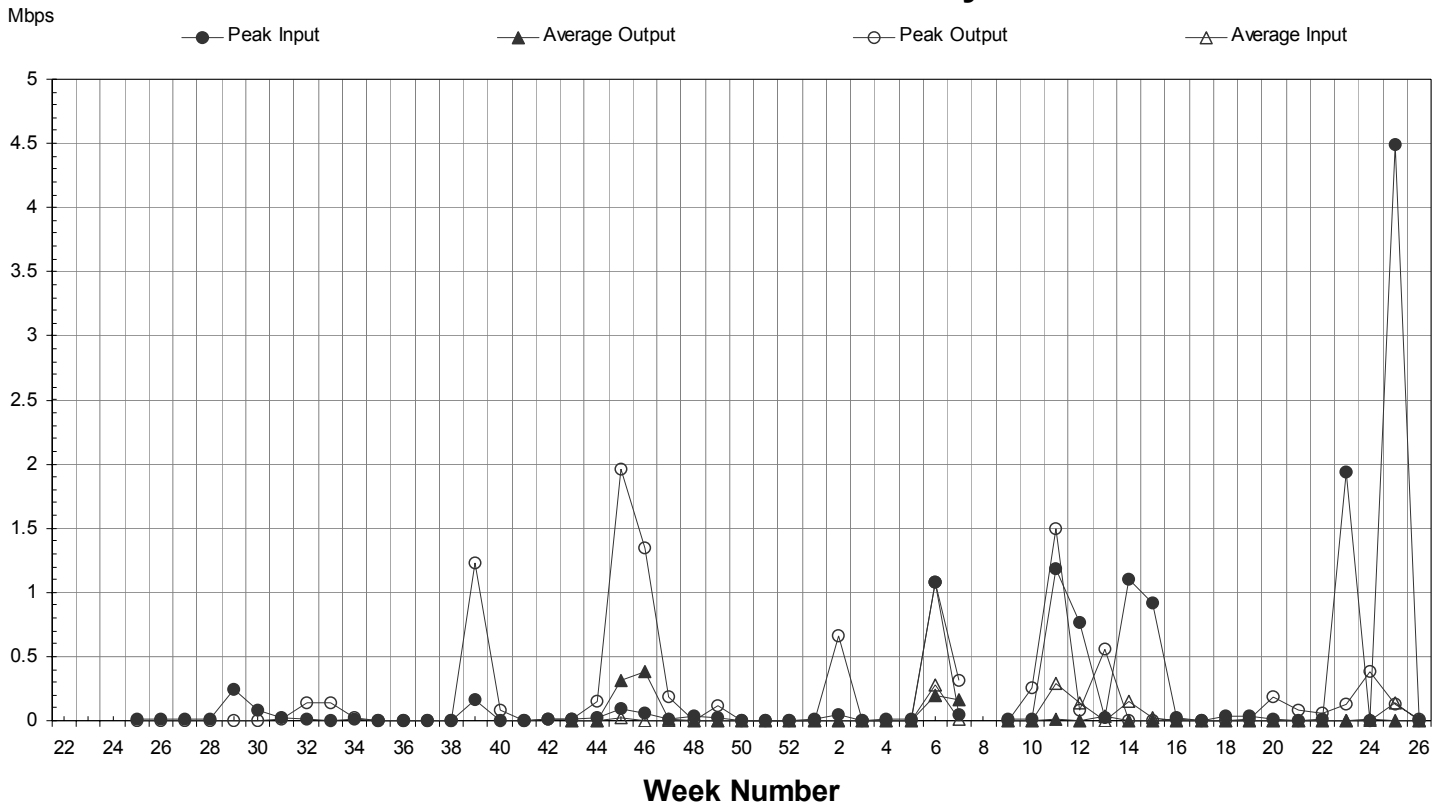
### CH - FR 6NET Trunk History



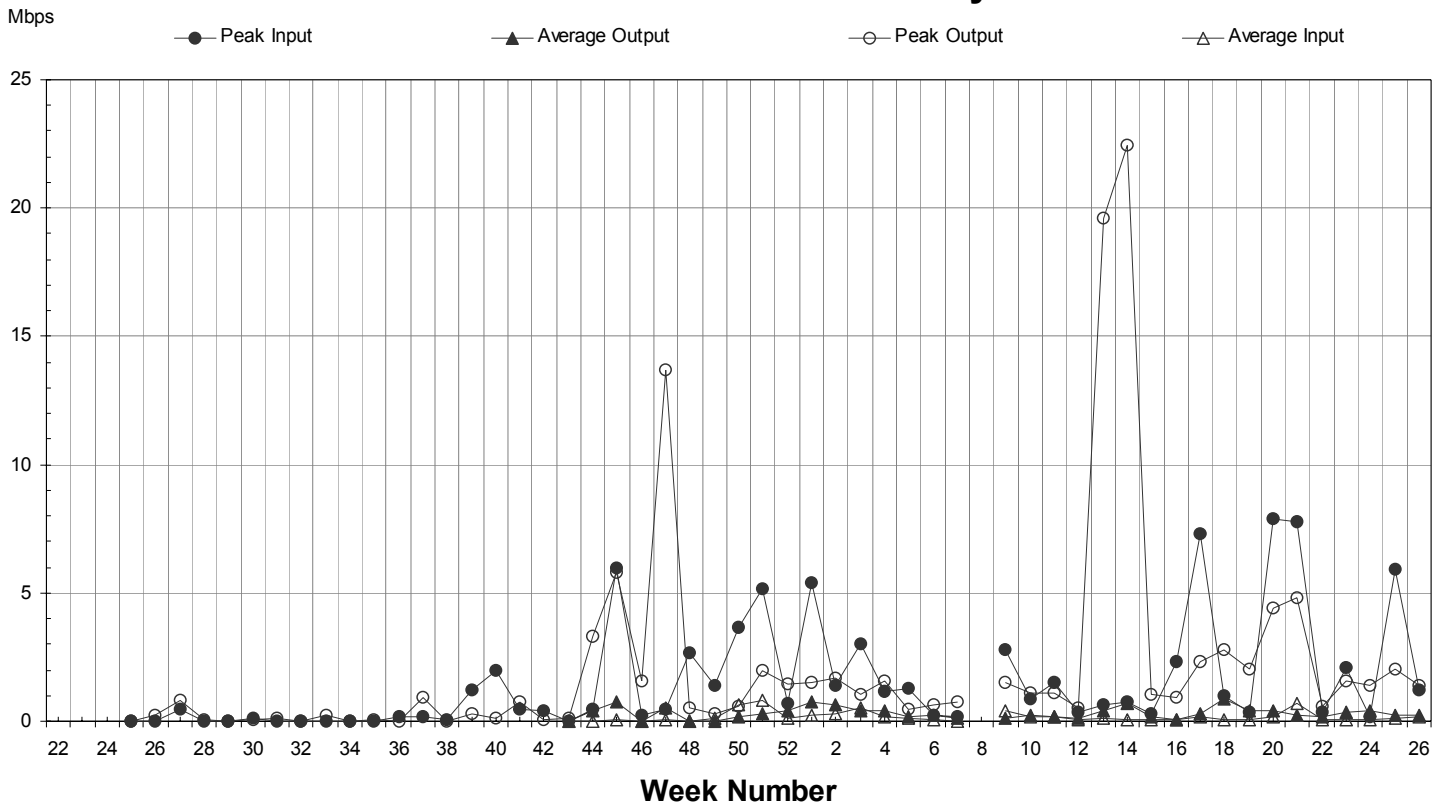
### CH - IT 6NET Trunk History



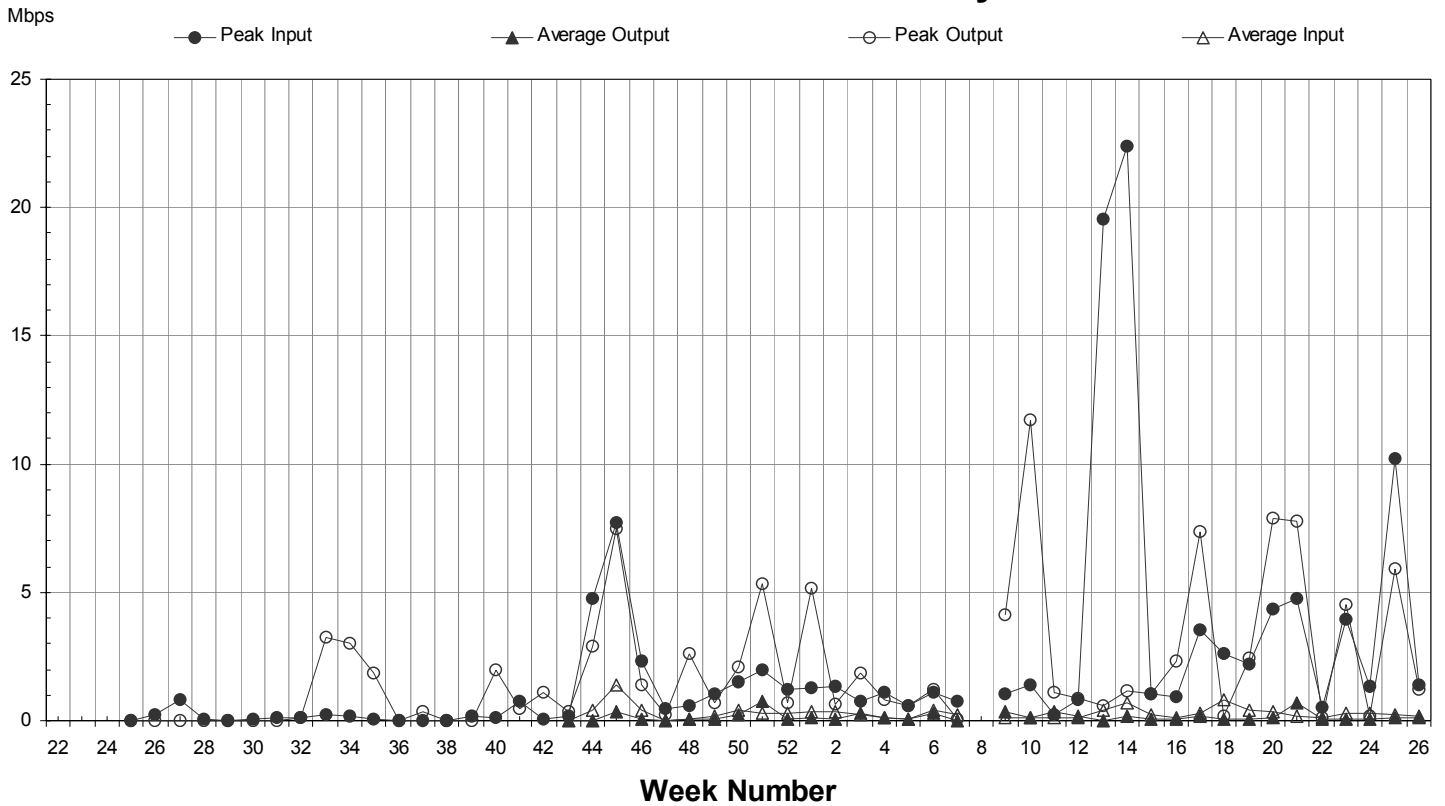
### DE - IT 6NET Trunk History



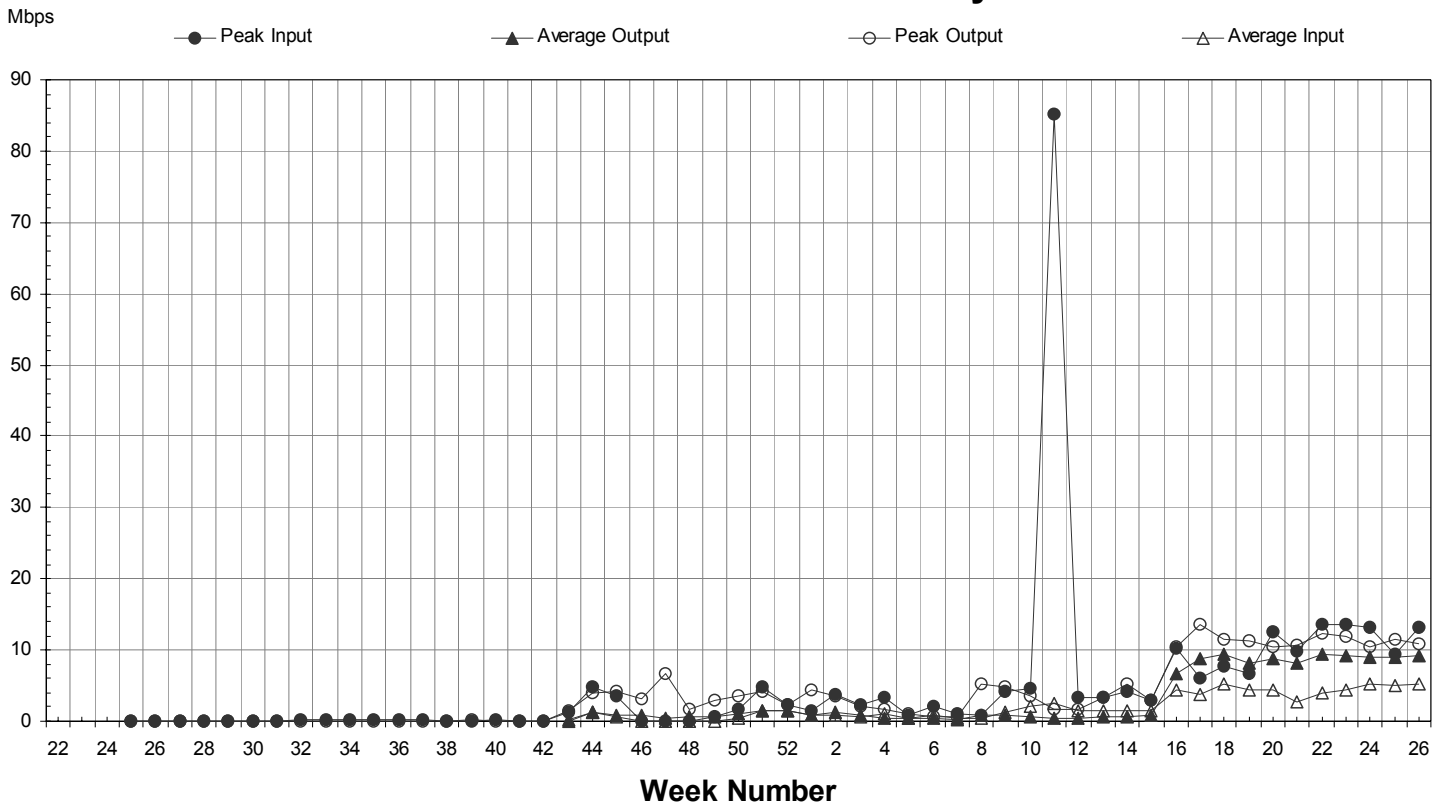
### DE - NL 6NET Trunk History



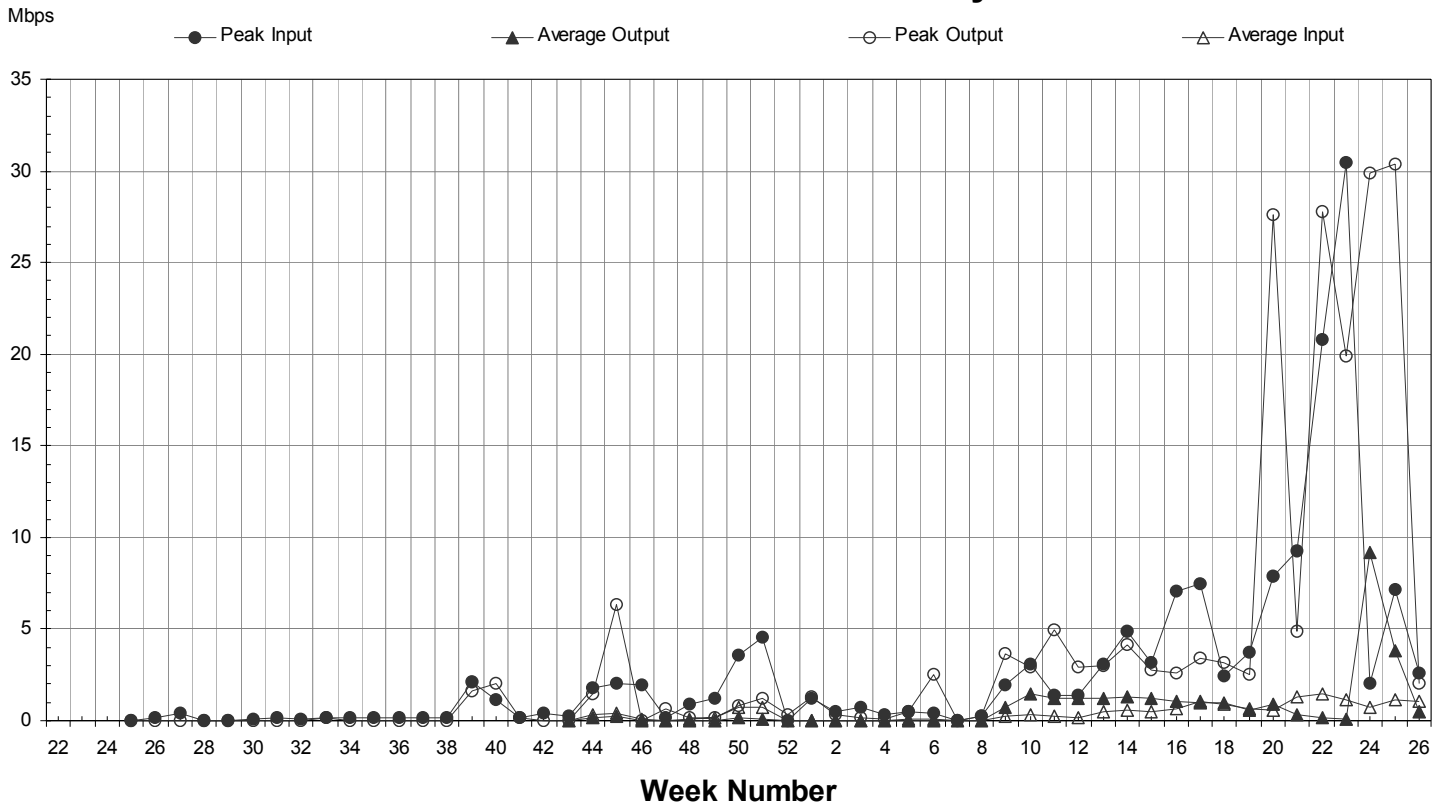
### DE - SE 6NET Trunk History



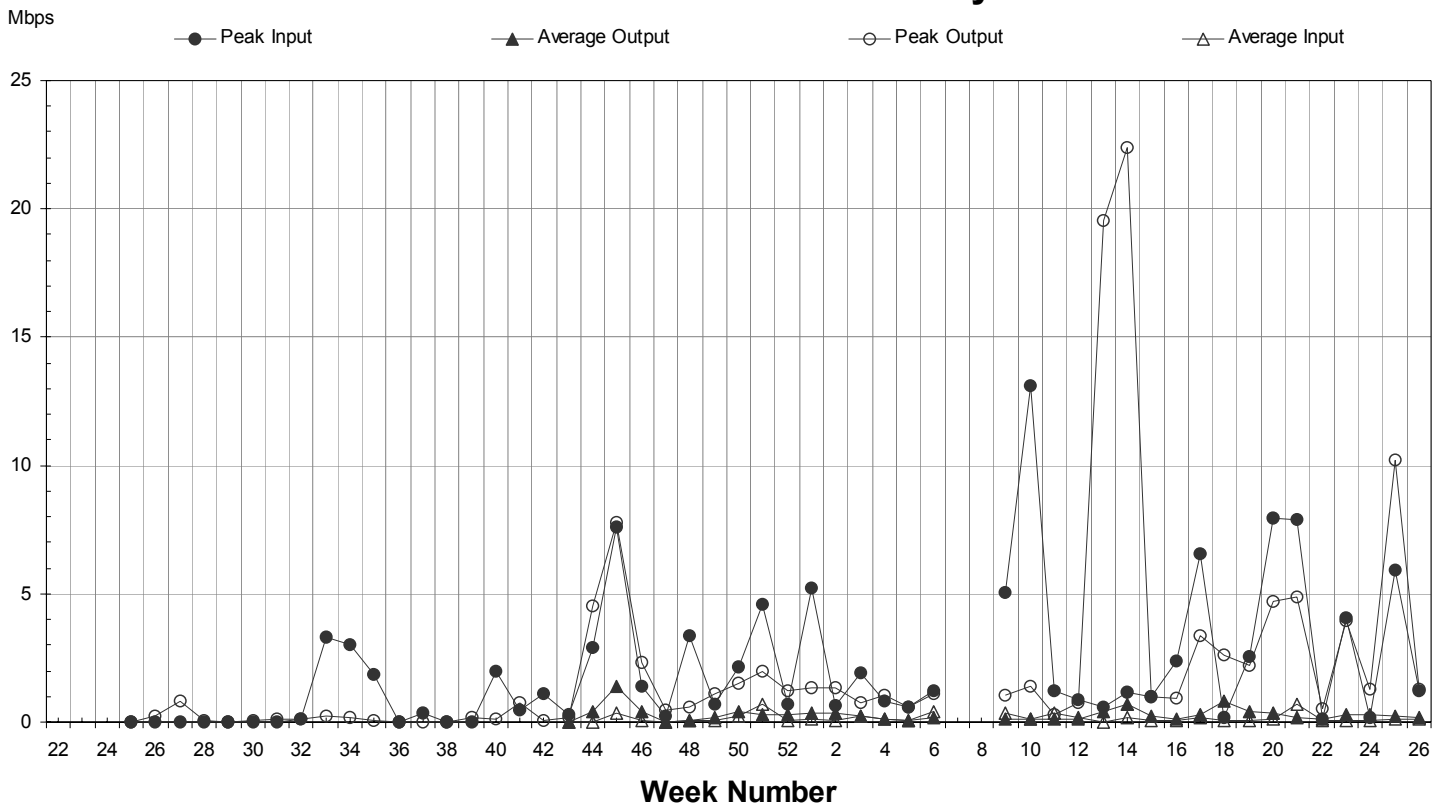
### FR - UK 6NET Trunk History



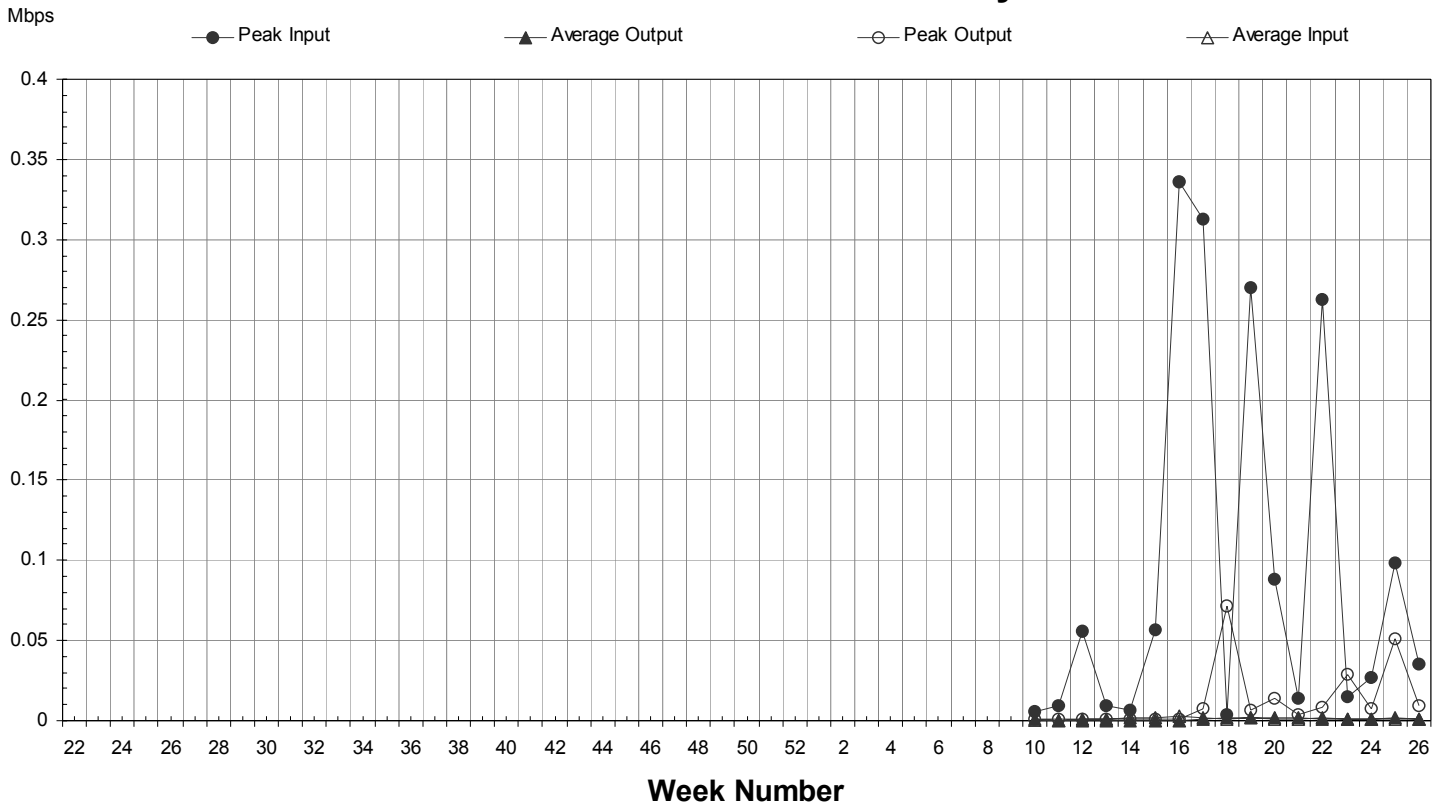
### NL - UK 6NET Trunk History



### SE - UK 6NET Trunk History



### UK - UK61 6NET Trunk History



## 6. MONITORING AND REPORTING PROCEDURE

This section describes the tools and procedures in place at the NOC to gather the measurements for this report. It is intended to provide the reader with some in-depth information in order to provide a better understanding of the various data and graphs.

The IP performance of the 6NET Network is monitored using InfoVista, a commercial network monitoring application which is configured to gather information from all the relevant routers at regular intervals using SNMP GET-requests. In order to avoid problems with 32-bit SNMP counters wrapping during the polling cycle on high speed links, 64-bit SNMP counters are used instead. The routers are all monitored for the same information which enables the 6NET NOC to provide uniform reporting across the entire 6NET network.

The traffic measurement is based on samples of the MIB variables ifHCInOctets and ifHCOutOctets, which give traffic at the physical or logical interface level. The 6NET links are mainly POS (Packet Over Sonet) but there is still some ATM VC (Virtual Channel). Based on a 15 minutes polling interval, Infovista generates data aggregated in months or in years.

The availability measurement is based on SNMP Traps received by the HP OpenView administration server. These traps are consolidated and compared to the corresponding trouble tickets to separate outages due to schedule maintenances and outages due to actual link failures.

*Currently the report includes these types of measures*

**Traffic history** : This plot shows the history of the peak and average traffic rates for each week of the reporting period and all preceding weeks during the last year. Infovista measurement has started in June 2002.

*The plots are produced for each of the following traffic categories*

- NREN Access Ports
- GÉANT Trunks

Note : For access ports, the sense of Input and Output is defined from the point of view of the 6NET network so that input traffic is received by 6NET from an NREN, and output traffic is sent from 6NET to an NREN.



**Definition of terms used in this report**

**Availability** : The calculation of availability is based on the following formula.

$$Availability = ( T - ( tu + ts ) ) / ( T - ts ) \times 100\%$$

Where T is the total time in the month, tu is the total unscheduled unavailability in one month and ts is the total scheduled unavailability in one month.

Note : Link Availability is calculated based on SDH or ATM links outages between two PoPs (Trunks) or between a PoP and an NREN (Access Ports). Service Availability is calculated on an end-to-end basis including NREN equipment. It represents the NREN ability to access the service.

**IfHCInOctets** : The total number of octets received on the interface, including framing characters.

**IfHCOutOctets** : The total number of octets transmitted out of the interface, including framing characters.

**MIB** : In the SNMP environment, the manager can obtain information from the agent by periodically polling managed objects. The management data exchanged between managers and agents is called the Management Information Base (MIB)