

EOS Production Sites

Network Performance Report: December 2009

This is a monthly summary of EOS network performance testing between production sites -- comparing the measured performance against the requirements.

Highlights:

- **Mostly stable flows with continued congestion at GSFC**
 - **GPA 3.74** (was 3.68 last month)
- **Requirements:** updated to Handbook 1.4.3 in May (was 1.4.2 previously)
 - Many Requirements dropped significantly
 - Some of these changes are under review
 - GSFC-JPL requirement increased
 - See below for more details on requirements changes
- **Only 1 flow below “GOOD”:**
 - **GSFC MODAPS-PDR to EROS (“Low”)**
 - Due to EBnet 1G congestion at GSFC
 - Would be rated “Adequate” from EDOS or GES DISC
- **NSIDC:** Disconnected from NISN PIP in December
 - All NSIDC flows are now via UCB campus
 - But UCB peers with NISN SIP
 - so flows to NASA Centers use NISN SIP (asymmetric)
 - Most other flows use Internet2
 - UCB plans to disconnect SIP in January
 - Testing structure revised to reflect this new architecture
- **LaRC-PTH:** Interface upgraded to GigE, with 200 mbps policing
- **Bottlenecks:**
 - **GSFC: EBnet to Doors Gig-E**
 - Average user flow: approx 700 mbps
 - Sustained (5 minute) peaks very close to 1 gbps
 - Upgrade to 10 Gig backbone is partially complete
 - Doors, EBnet routers upgraded to 10 Gig in April, May
 - GES DISC, Closed EBnet moved to 10 Gig EBnet previously
 - 1 gig connections
 - performance improved at that time!
 - **ESDIS and ESMO routers connected to 10 gig backbone in December – 10 gig connections**
 - **PPS connected to ESDIS router**
 - Other systems to be upgraded individually
- Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, other comments in Blue.

Ratings Changes:

Upgrades: ↑ WSC → ASF: **Adequate** → **GOOD**

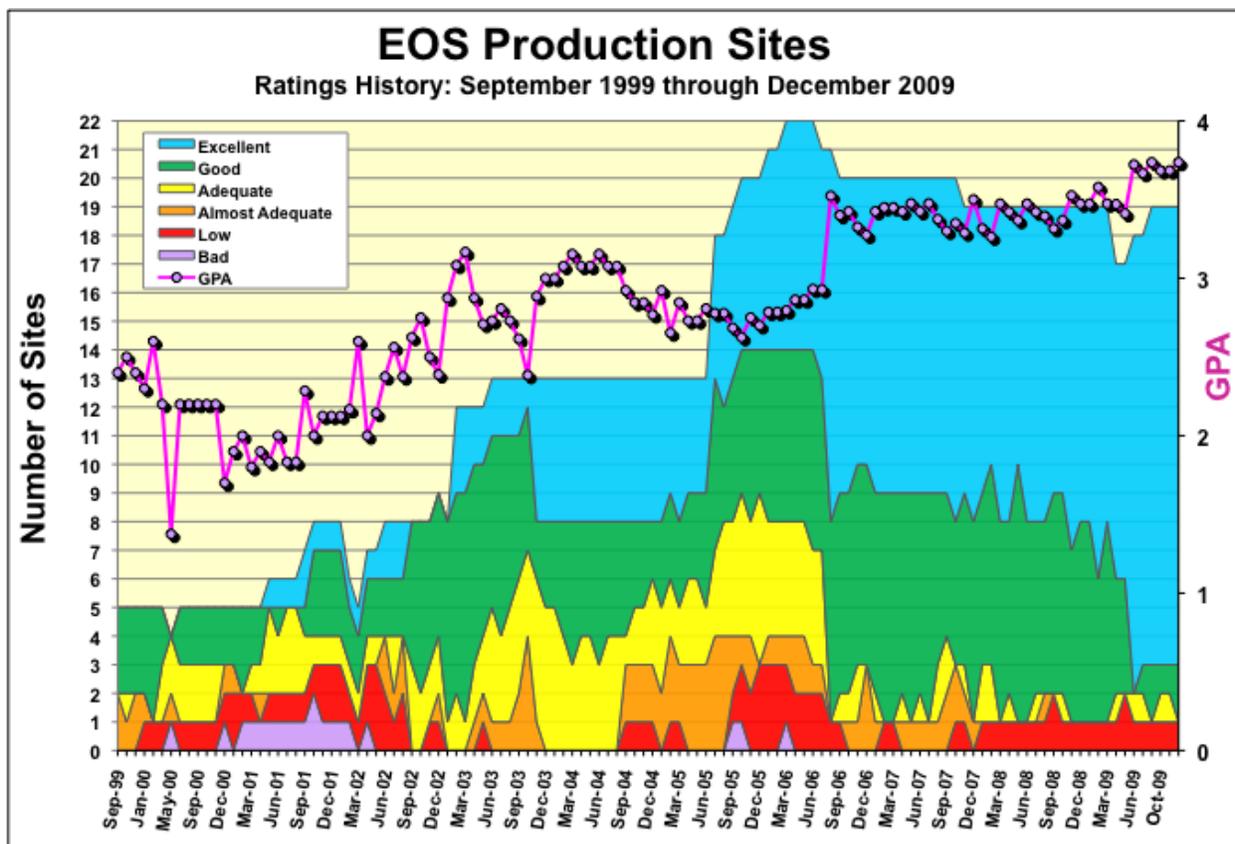
Downgrades: ↓ None

Ratings Categories:

Rating	Value	Criteria
Excellent:	4	Total Kbps > Requirement * 3
Good:	3	1.3 * Requirement <= Total Kbps < Requirement * 3
Adequate:	2	Requirement < Total Kbps < Requirement * 1.3
Almost Adequate:	1.5	Requirement / 1.3 < Total Kbps < Requirement
Low:	1	Requirement / 3 < Total Kbps < Requirement / 1.3
Bad:	0	Total Kbps < Requirement / 3

Where Total Kbps = Integrated Kbps (where available), otherwise just iperf

Ratings History:



The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

Requirements Basis:

While the long term plan is to use the requirements from the EOSDIS network requirements database, the database does not appear ready to be used for that purpose at this time. Some mission flows have not been included yet (e.g., TRMM), and the network requirements based on rapid reprocessing (e.g., MODIS 27X, AIRS 20X) have not been resolved.

Thus the requirements are based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the database requirements were derived). Previously, the requirements were derived from version 1.4.2.

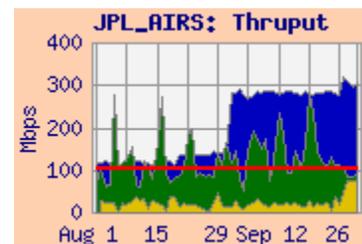
One main difference between Handbooks 1.4.2 and 1.4.3 is that most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

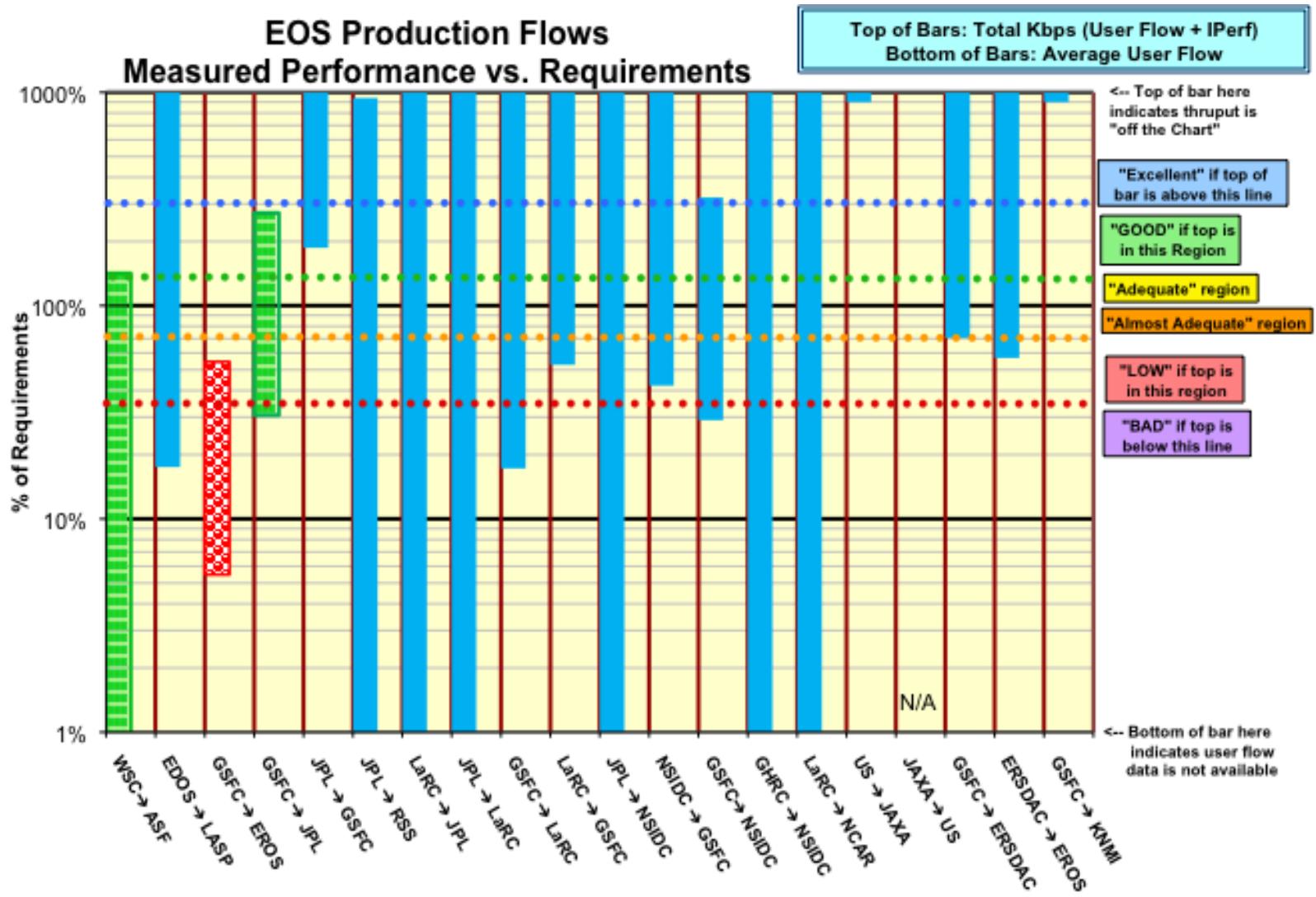
However, it seems likely that there are some flows which have been omitted. For example, the GES DISC to KNMI requirement for Level 1+ data (without contingency) was 1.4 mbps in version 1.4.2, but only 22 kbps in version 1.4.3. The user flow has been averaging about 1.4 mbps, suggesting that version 1.4.2 was correct, and that version 1.4.3 has omitted something.

Integrated Charts:

Integrated charts are included with site details, where available. These charts are “Area” charts, with a “salmon” background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (JPL, in this example) obtained from routers via “netflow”. The green area is stacked on top of the user flow, and represents the “adjusted” daily average iperf thrupt between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities. On some charts a blue area is also present – “behind” the green area – representing adjusted iperf measurements from a second source node at the same facility.



This graph shows a bar for each source-destination pair – relating the measurements vs the requirements for that pair. The bottom of each bar is the average measured user flow to a site. Thus the bottom of each bar indicates the relationship between the requirements and actual flows. Note that the requirements generally include a 50% contingency factor above what was specified by the projects, so a value of 66% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar represents the integrated measurement, combining the user flow with Iperf measurements – this value is used to determine the ratings.



1) EROS:

Ratings: GSFC → EROS: Continued **Low**
 ERSDAC → EROS: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	239.1	170.1	65.0	18.8	186.9
GSFC-EDOS → EROS LPDAAC	317.1	314.1	132.4		
GES DISC → EROS LPDAAC	436.7	365.3	158.5		
ERSDAC → EROS LPDAAC	83.2	82.5	81.5	4.7	82.6
GSFC-EBnet-PTH → EROS PTH	356.7	101.1	26.2		
GSFC-ENPL → EROS PTH	461.1	456.4	323.6		
GSFC-NISN → EROS PTH	481.7	474.2	408.5		
NSIDC SIDADS → EROS LPDAAC	88.1	83.2	79.6		
LaRC PTH → EROS PTH	170.2	169.5	104.8		

Requirements:

Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08-11	343	Low
ERSDAC → EROS	FY '06 - '10	8.3	Excellent

Comments:

GSFC → EROS: The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement, since that is the primary flow. The route is via the Doors to NISN SIP, via the NISN OC-48 (2.5 gbps) backbone to the NISN Chicago CIEF, then via GigE to the StarLight gigapop, peering with the EROS OC-12 (622 mbps).

The user flow this month was typical of the last few months, and remains far below the nominal requirement, which includes a high level of MODIS reprocessing.

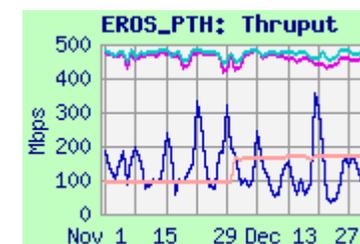
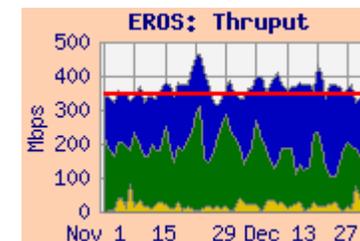
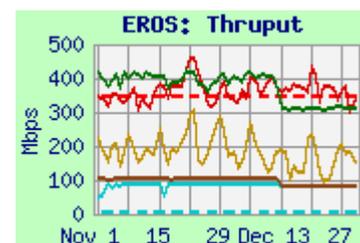
Performance from the hosts on the 1 Gig EBnet (MODAPS, and GSFC-EBnet-PTH) is predominantly limited by congestion on the EBnet GigE circuit at GSFC, as indicated by their large best:worst ratios (e.g., 3.7:1 from MODAPS). Thruput from MODAPS remains more than 30% below the requirement so the rating remains **Low**.

EDOS was moved to the new 10 Gig EBnet on October 30, and the GES-DISC was moved in June, with much better performance! While the median daily best thruput from GES DISC is about 80% higher than from MODAPS, its median daily worst thruput is 2.4 times higher! It would be rated **Adequate**. Likewise, the GSFC-NISN host uses the same NISN route as above, but is connected outside the congested EBnet to Doors Gig-E circuit, so its performance is also much higher. The ENPL host has a direct connection to the MAX, also bypassing the congested EBnet Gig-E circuit. Its route is via MAX to Internet2 to StarLight in Chicago. Performance is similar to the GSFC-NISN source. Both are predominantly limited by the OC-12 to EROS, and would be rated **Good**.

ERSDAC → EROS: See section 7 (ERSDAC) for further discussion of this performance.

NSIDC → EROS: Performance dropped a bit with NSIDC's switch to from NISN to Internet2 in December, with a longer RTT.

LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH improved this month due to LaRC-PTH's upgrade to a GigE interface (with policing at 200 mbps). The route is via NISN to the Chicago CIEF.



2) to GSFC

Ratings: NSIDC → GES DISC: Continued **Excellent**
 LDAAC → GES DISC: Continued **Excellent**
 JPL → GES DISC: Continued **Excellent**

Web Pages:

<http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>

http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
EROS LPDAAC → GES DISC	172.2	133.4	116.7	
EROS PTH → GSFC-EBnet PTH	387.5	352.1	241.6	
JPL-PTH → GSFC-EBnet PTH	64.8	64.1	49.6	1.05
LDAAC → GES DISC	623.6	579.8	375.2	0.19
LARC-ANGe → GSFC-EBnet PTH	307.6	213.4	162.1	
NSIDC DAAC → GES DISC	342.0	301.5	124.4	0.24
NSIDC DAAC → GSFC-ISIPS	78.5	78.3	67.8	

Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '09	0.6	Excellent
LDAAC → GES DISC	FY '07 – '09	0.4	Excellent
JPL → GSFC combined	CY '06-09	3.2	Excellent

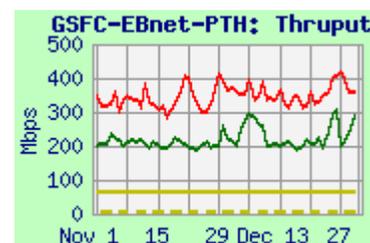
Comments:

EROS → GSFC: The thrupt for tests from EROS LPDAAC to GES DISC and EROS PTH to EBnet-PTH were stable this month, but note that the DAAC to DAAC flow still cannot use most of the WAN capability (compared to the EROS-PTH to GSFC-EBnet-PTH results), due to packet loss between the LPDAAC and the EROS ECS firewall.

JPL → GSFC: Thrupt was very stable this month. With the modest requirement (reduced from 7.4 mbps in May), the rating remains "Excellent". The actual user flow remains lower than even this reduced requirement.

LaRC → GSFC: Performance from LDAAC → GES DISC remained way above 3 x the modest requirement, so the rating continues as "Excellent". The user flow this month was way below the typical flow, and the requirement.

NSIDC → GSFC: Performance from NSIDC to GSFC (DAAC and ISIPS) Improved this month, with NSIDC's switch from NISN to Internet2. With the low requirement (reduced from 13.3 mbps in May), the rating remains "**Excellent**". The user flow remains greatly reduced from the 1.2 mbps in May.

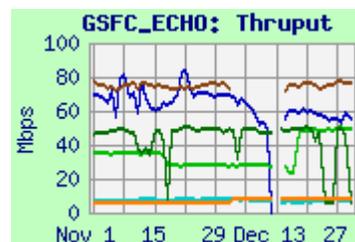


2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsf/GSFC_ECHO.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	68.0	58.3	43.1
EROS LPDAAC ftp	8.0	7.2	5.6
GES DISC	n/a	n/a	n/a
GES DISC ftp	n/a	n/a	n/a
LaRC ASDC DAAC	50.4	28.1	27.0
LaRC ASDC DAAC ftp	50.5	48.2	12.9
NSIDC DAAC	81.5	75.5	62.2
NSIDC DAAC ftp	8.2	8.0	2.8



Comments:

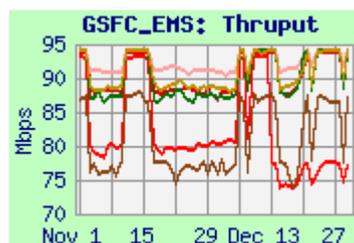
Testing is performed to GSFC-ECHO from the above nodes, both iperf and ftp. Results are generally steady. Performance limitations are from the 100 mbps Fast-E and TCP window size – especially on ftp with long RTT.

2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsf/GSFC_EMS.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS-PTH	77.9	77.5	72.7
GES DISC	93.8	93.7	85.9
GSFC-PTH	94.1	94.1	88.7
LARC-PTH	94.0	94.0	80.2
MODAPS-PDR	94.1	93.7	85.4
NSIDC-PTH	89.3	86.3	67.9



Comments:

Testing is performed to GSFC-EMS from the above nodes, iperf only. Results are very steady. Performance limitation is from the 100 mbps fast-E connection.

3) JPL:

3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Good**

Web Pages: http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-GES DISC → JPL-AIRS	306.2	273.6	166.6	31.2	276.4
GSFC-NISN → JPL-AIRS	275.0	263.9	243.2		
GSFC-EBnet-PTH → JPL-AIRS	164.7	94.8	38.4		
GSFC-EBnet-PTH → JPL-PODAAC	191.4	85.7	21.8		
GSFC-EBnet-PTH → JPL-QSCAT	91.5	77.1	19.3		
GSFC-EBnet-PTH → JPL-MLS	133.9	53.8	14.4		
GSFC-NISN → JPL-MLS	391.8	375.7	279.2		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	FY '08-'09	101.7	Good
GSFC → JPL AIRS	FY '08-'09	98	Good
GSFC → JPL PODAAC	FY '08-'11	1.5	Excellent
GSFC → JPL QSCAT	FY '08-'11		n/a
GSFC → JPL MLS	FY '08-'09	2.1	Excellent

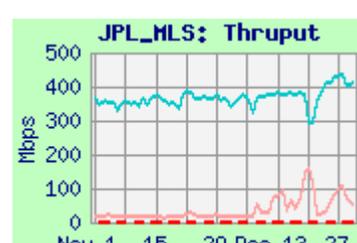
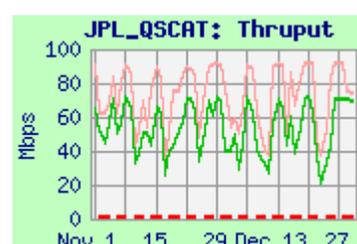
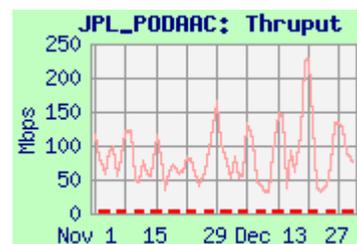
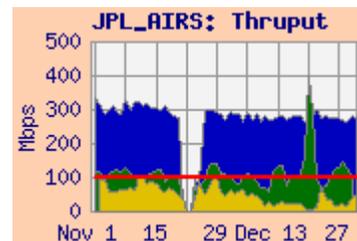
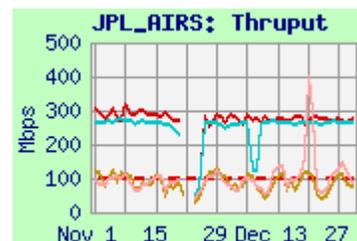
Comments: The EBnet to Doors congestion at GSFC was the bottleneck for the flows from GSFC-EBnet-PTH, and from GES DISC until the GES DISC was moved to the 10 Gig EBnet in early June. The user flow from GSFC/EOS dropped back to near normal this month, after increasing at the end of September, apparently due to increased MODIS flows.

AIRS, Overall: The median thrupt from GES DISC improved in early September, due to retuning of the testing. Thrupt was above the AIRS requirement, by slightly less than 3x, so the AIRS rating drops to "Good". The JPL overall rating is based on this test compared with the sum of all the GSFC to JPL requirements – the overall rating is also slightly below 3x the requirement, so it remains "Good".

PODAAC: Daily thrupt peaks from EBnet-PTH averaged 190 mbps, while the median thrupt is less than half of that, due to congestion at GSFC. The GSFC-PODAAC requirement (for MODIS data) is only 1.5 mbps, rating "Excellent".

QSCAT: The thrupt from GSFC-EBnet-PTH peaks close to 100 mbps – limited by a Fast-E connection at QSCAT, and congestion at GSFC. The QSCAT requirement was only 1.3 mbps, but does not appear in the 1.4.3 handbook (the rating would remain "Excellent", based on the old requirement). Performance to a second QScat node (ketch) (green line), is similar to the primary node.

MLS: The GSFC-MLS requirement is for MLS and GEOS flow, and was reduced again (was 5.9 mbps since April '08). Thrupt from GSFC-EBnet-PTH was very noisy, with a 9.3:1 best:worst ratio. This testing was retuned in December, with improved results. Testing from GSFC-NISN avoids the EBnet congestion seen from GSFC-EBnet-PTH, with much higher and more stable results.



3.2) LaRC ↔ JPL

Ratings: LaRC → JPL: Continued **Excellent**
 JPL → LaRC: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtml

http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

http://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC DAAC → JPL-TES	398.9	387.1	76.1
LaRC PTH → JPL-TES	181.8	158.4	104.9
LaRC PTH → JPL-TES sftp	n/a	n/a	n/a
LaRC PTH → JPL-PTH	78.2	49.8	45.3
LaRC PTH → JPL-PTH sftp	33.2	33.2	33.1
LaRC DAAC → JPL-MISR	61.0	41.6	21.0
LaRC PTH → JPL-MISR	88.1	87.9	63.2
JPL-PTH → LaRC PTH	73.8	61.3	55.1

Requirements:

Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '10	7.0	Excellent
LaRC DAAC → JPL-MISR	FY '07 – '10	32.9	Adequate
LaRC → JPL-Combined	FY '07 – '10	39.9	Excellent
JPL PTH → LaRC PTH	FY '07 – '10	1.5	Excellent

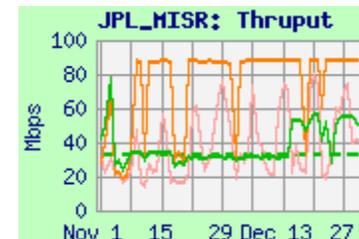
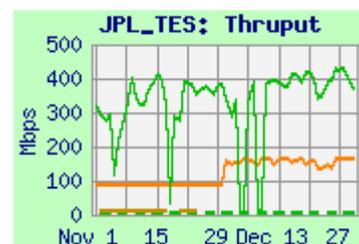
Comments: LDAAC was moved to campus address space in March '07. User flow data is no longer available from LaRC (has been requested but not implemented). Thus no integrated graphs are available from LaRC.

LaRC → JPL (Overall, TES): Median performance from LaRC ASDC DAAC to JPL-TES remains well over 3 x the TES and combined requirements, so the TES and Overall ratings remain "**Excellent**". Testing from LaRC-PTH improved with the interface upgrade to Gig-E.

SFTP testing was suspended in November, due to account problems; testing resumed in January. Sftp results are better from LaRC-PTH to JPL-PTH which uses a larger TCP window size.

LaRC → JPL (MISR): Testing from LaRC ASDC DAAC was retuned in December, with improved thruput; the median thruput is above the requirement, but by slightly less than 30%, so the rating remains "**Adequate**". Thruput is much higher from LaRC-PTH, would be rated "**Good**".

JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving; it was reduced from 4.4 mbps in May (and had been reduced in April '08 from 52.6 mbps). Thruput this month was mostly steady (not bimodal between 60 and 85 mbps, as has often been the case). The rating remains "**Excellent**".



4) Boulder CO:

4.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
 JPL → NSIDC: Continued **Excellent**
 GHRC → NSIDC: Continued **Excellent**

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

The NSIDC DAAC has disconnected from NISN PIP in December – all flows now go via the UCB campus, usually via FRGP to Internet2. Accordingly, the testing has been restructured. Previously, the testing was reported based on whether the NISN network or Internet2 was used. Now test results will be reported based on the destination node – either the S4PA DAAC, SIDADS, or the Network Performance Test Host (PTH). Note the PTH is still connected to and using NISN PIP. Also note that UCB currently peers with NISN SIP, so that route is still used – however, it will be removed soon.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODIS-PDR → NSIDC	113.7	86.6	30.8	8.0	88.6
GES-DISC → NSIDC	191.4	163.0	54.5		
GSFC-ISIPS → NSIDC (iperf)	83.4	44.7	12.8		
GSFC-ISIPS → NSIDC (ftp)	19.4	12.7	2.7		
JPL PODAAC → NSIDC	56.6	53.4	43.7		
GHRC → NSIDC DAAC (iperf)	37.5	36.8	32.2		
GHRC → NSIDC DAAC (ftp pull)	24.8	24.6	17.0		

Requirements:

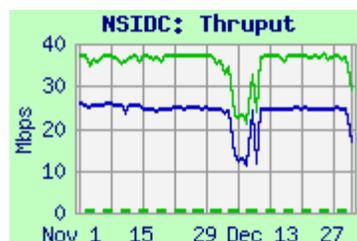
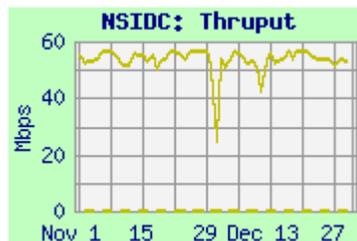
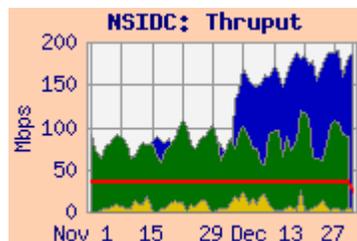
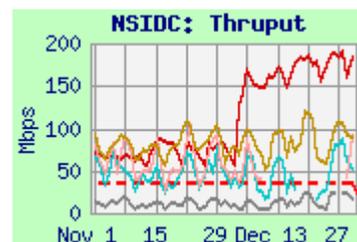
Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '10	27.6	Excellent
JPL → NSIDC	CY '07 – '10	0.2	Excellent
GHRC → NSIDC	CY '07 – '10	0.5	Excellent

Comments: GSFC → NSIDC S4PA: This rating is based on testing from the MODAPS PDR server to the NSIDC DAAC, now via Internet2, since this is the primary production flow. The throughput values improved with the route change, but remain noisy, due to 1G EBnet congestion at GSFC. Throughput improved even more from GES DISC, which is on the 10 gig backbone. The requirement was reduced in May '09 from 34.5 mbps (was 64 mbps in April '08). The Integrated throughput is above this lower requirement, by slightly more than 3 x, so the rating remains **Excellent**. Note that the user flow remains **MUCH lower**, even than the reduced requirement.

GSFC-ISIPS → NSIDC: The EBnet congestion at GSFC is affecting ISIPS as well, with a 6.5:1 best to worst ratio.

JPL PODAAC → NSIDC S4PA: Testing from PODAAC to NSIDC was switched to Internet2 at the end of September, with significant performance improvement at that time (the user data flows had already been switched). The requirement was reduced from 1.34 mbps in May '09; the rating remains **Excellent**.

GHRC → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via Internet2, with the return route (still) via NISN SIP. The median throughput is more than 3x the requirement (reduced from 7.5 mbps in May), so the rating remains **Excellent**. The ftp performance is limited by the TCP window size.



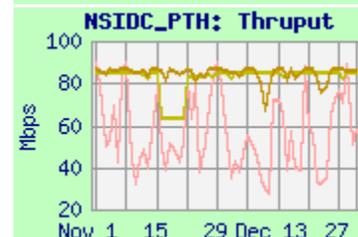
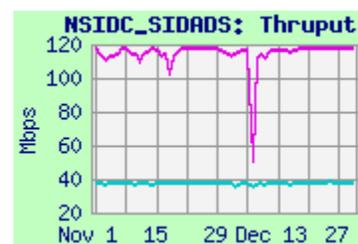
Test Results: NSIDC SIDADS, PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC_SIDADS	117.9	116.8	111.9
GSFC-NISN → NSIDC_SIDADS	38.5	37.7	35.2
GSFC-EBnet-PTH → NSIDC-PTH	90.2	51.4	16.0
MODIS-PDR → NSIDC-PTH	88.7	86.0	53.3
JPL PTH → NSIDC-PTH	85.2	85.0	81.8

GSFC → NSIDC-SIDADS: Thruput via Internet2 to SIDADS from ENPL was steady and well above the requirement.

GSFC → NSIDC-PTH: Thruput via NISN PIP was noisy due to EBnet congestion at GSFC

JPL-PTH → NSIDC-PTH: Thruput via NISN PIP was very steady.

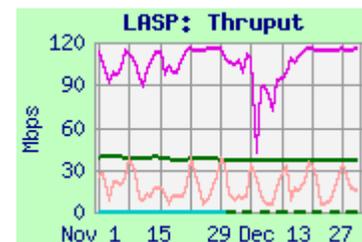
**4.2) LASP:**

Ratings: GSFC → LASP: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml>

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC EDOS → LASP (blue)	36.7	36.6	0.3
GSFC EBnet-PTH → LASP (iperf)	35.9	16.6	2.8
GSFC EBnet-PTH → LASP (sftp)	n/a	n/a	n/a
GSFC ENPL → LASP (green)	115.2	110.4	92.8



Comments: GSFC → LASP: Thruput from EDOS to the LASP blue network via NISN PIP improved and got much steadier with EDOS' move to the 10 gig backbone, late in October. But thruput remained noisy from GSFC-PTH, attributed mostly to 1G EBnet congestion at GSFC. The median thruput from EDOS remains well over 3x the 0.4 mbps requirement, so the rating remains "**Excellent**". Performance is much higher from GSFC-ENPL to a node on LASP's green network via Internet2, which avoids the EBnet congestion at GSFC. The average user flow this month was a typical 73 kbps. Sftp thruput testing has been suspended in late November due to account issues.

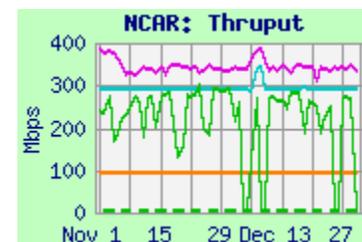
4.3) NCAR:

Ratings: LaRC → NCAR: Continued **Excellent**

Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>

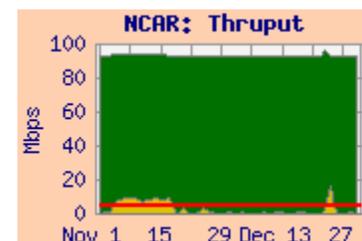
Test Results:

Source	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
LaRC ASDC	307.7	250.5	6.7	0.1
GSFC-ENPL-GE	378.9	341.3	286.3	n/a
GSFC-ENPL-FE	93.1	93.0	92.9	
GSFC-NISN	294.3	293.8	261.4	



Comments: NCAR (Boulder, CO) has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements. Thruput from LaRC was again noisy this month, but the median remains well above 3 x the reduced requirement, so the rating remains "**Excellent**".

From GSFC-ENPL-GE, with a Gig-E connection to MAX, the median thruput is less noisy. From GSFC-NISN, the route is via NISN to the MAX (similar to the route from LaRC). Performance is very stable. The average user flow from GSFC this month was only 1.2, compared to the old 5.1 mbps requirement.



5) GSFC → LaRC:Rating: Continued **Excellent**

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LDAAC	362.5	313.4	173.5	4.0	313.4
GSFC-EDOS → LDAAC	529.1	429.6	105.1		
GSFC-EBnet-PTH → LaRC-ANGe	405.7	340.4	196.5		
GSFC-NISN → LaTIS	403.3	395.8	341.5		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '09	31.3	Excellent

Comments:

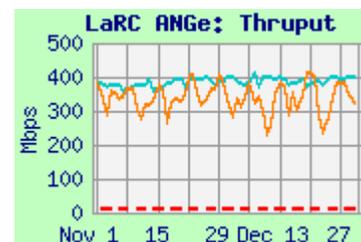
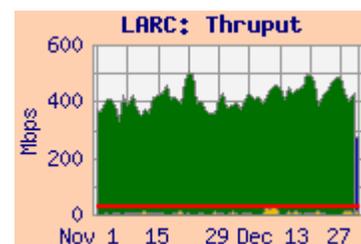
GSFC → LaRC: The requirement was reduced from 60.5 mbps (after being reduced effective January '08 from 86.9 mbps due to decreased GEOS flows). The rating is based on the GES DISC to LaRC ASDC DAAC thrupt, compared to this combined requirement. The integrated thrupt remains well above 3 x this requirement, so the rating remains "**Excellent**".

The GES DISC results improved in June when the GES DISC moved to the 10 Gig EBnet LAN, as did results from EDOS with its move to the 10 Gig at the end of October – thrupt from EDOS is now higher than from GES DISC.

The difference between the daily best, median, and average values from GSFC-EBnet-PTH is attributed to congestion on the 1 gig part of EBnet at GSFC.

As seen on the Integrated graph, the 4 mbps average user flow (typical for recent months) remains much lower than the [even the reduced] requirement.

ANGe (LaTIS): The thrupt from GSFC-EBnet-PTH to ANGe via PIP was again noisy due to EBnet congestion at GSFC. Testing to LaTIS from GSFC-NISN avoids this congestion, with much more consistent results.

**6) US ↔ JAXA**

Ratings: US → JAXA: Continued **Excellent**
 JAXA → US: **X Testing Discontinued**

Web Pages: http://ensight.eos.nasa.gov/Organizations/production/JAXA_EOC.shtml
http://ensight.eos.nasa.gov/Organizations/production/JAXA_HEOC.shtml
http://ensight.eos.nasa.gov/Missions/ALOS/JAXA_TKSC.shtml

The JAXA test hosts at EOC Hatoyama were retired on March 31 (the end of the Japanese government's fiscal year). No additional testing is planned for AMSR or TRMM. All testing to JAXA-TKSC for ALOS was terminated at the end of June.

However, the user flow to JAXA continues to be measured. This month the average user flow was 1.2 mbps. Comparing this value to the new requirement of 0.1 mbps produces a rating of "**Excellent**". Note that the user flow is much more consistent with the old 2.0 mbps requirement

7) ERSDAC ↔ US:

Ratings: **GSFC → ERSDAC: Continued Excellent**
ERSDAC → EROS: Continued Excellent

Web Page : <http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml>

US ↔ ERSDAC Test Results

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → ERSDAC	82.4	77.7	37.4	3.8	78.0
GES DISC → ERSDAC	30.4	25.8	21.5		
GSFC ENPL (FE) → ERSDAC	89.1	89.0	88.9		
ERSDAC → JPL-ASTER IST	90.0	89.7	89.4		
ERSDAC → EROS	83.2	82.5	81.5		

Requirements:

Source → Dest	FY	Mbps	Rating
GSFC → ERSDAC	'05 - '09	5.4	Excellent
ERSDAC → JPL-ASTER IST	'07- '09	0.31	Excellent
ERSDAC → EROS	'07- '09	8.3	Excellent

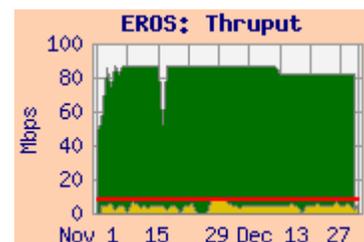
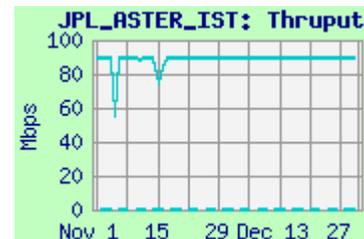
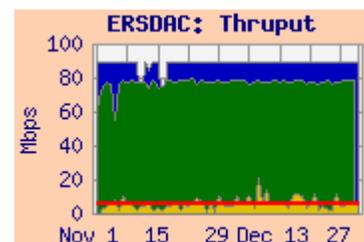
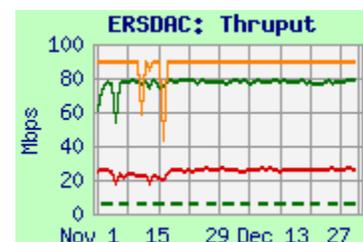
Comments:

GSFC → ERSDAC: The median thrupt from EDOS improved at the end of October with EDOS' move to the 10 Gig EBnet, avoiding the congestion on the 1 gig EBnet. It remains well above 3 x the reduced requirement, so the rating remains "Excellent". The integrated chart shows that the user flow is stable, and consistent with the new requirement.

Thruput from GES DISC to ERSDAC is limited by packet loss at the GigE to FastE switch at Tokyo-XP. The GES DISC GigE source does not see any bottlenecks until this switch (The Internet2 and APAN backbones are 10 Gbps), and thus exceeds the capacity of the switch's FastE output circuit, causing packet loss. But the FastE connected ENPL node is limited to 100 mbps by its own interface, so does not suffer performance degrading packet loss – and the performance is much higher.

ERSDAC → JPL-ASTER-IST: The median thrupt is very stable, and remains well above the [unstated] requirement (IST requirements are generally 311 kbps), so the rating remains "Excellent".

ERSDAC → EROS: The median thrupt remains well above the reduced requirement (was 26.8 mbps previously). The new 8.3 mbps requirement is much closer to the actual flow of 4.7 mbps. The median thrupt is more than 3 x the reduced requirement, so the rating remains "Excellent".



8) ASF

Ratings: IOnet: X Discontinued

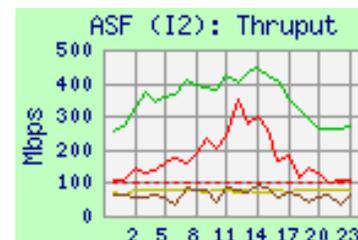
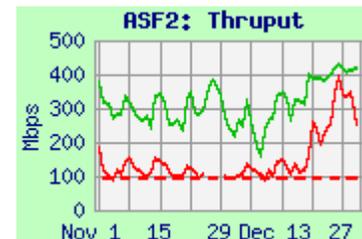
WSC → ASF: ↑ Adequate █ GOOD

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/ASF2.shtml>**Test Results:**

Source	Medians of daily tests (mbps)			Requirement	Rating
	Best	Median	Worst		
WSC	423.0	136.0	76.6	96	Good
GSFC	433.8	327.8	185.1		

Comments: IOnet: The ASF IOnet host and firewall was reconfigured in October '07, and all IOnet testing stopped at that time.

Testing to ASF is for the ALOS mission. The route from WSC is via NISN SIP, peering with Internet2 at one of several possible peering points (expected to be StarLight in Chicago). Internet2 connects to the "Pacific Northwest Gigapop" (PNW) in Seattle. From there the University of Alaska – Fairbanks (UAF) has a dedicated OC-12 circuit to campus, then via campus LAN to the Alaska Satellite Facility (ASF). There is a strong diurnal cycle from both sources, indicating congestion at UAF. The median is now above the requirement by more than 30%, so the rating improves to "Good".



Thruput by Time of day

9) Remote Sensing Systems (RSS):

Rating: Continued Excellent

Web Page: <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>**Test Results:**

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
JPL → RSS	5.68	4.55	1.52	0.5

Comments: RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving data from JPL, and sending its processed results to GHRC (aka NSSTC) (UAH, Huntsville, AL). This month the thruput from JPL remained noisy, as usual -- periods of low performance are believed to be attributable to correspondingly high user flow (User flow data remains unavailable on this circuit). The requirement was reduced with handbook 1.4.3 (was 2.5 mbps previously). The median iperf was more than 3 x the reduced requirement, so the rating remains "Excellent".

Note that with the present configuration (passive servers at both RSS and GHRC), the RSS to GHRC performance cannot be tested.



10) KNMI: Rating: Continued **Excellent**

Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
OMISIPS → KNMI-ODPS	141.5	89.6	23.3	0.03
GSFC-ENPL → KNMI-ODPS	122.6	106.2	82.5	

Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant’s 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam. The rating is based on the results from OMISIPS at GSFC to the ODPS primary server, protected by a firewall, and remains “Excellent”. **The 6:1 best to worst ratio is attributed to EBnet congestion, not present from GSFC-ENPL.** The user flow averaged 2.4 mbps this month, as shown on the integrated graph. **This is much closer to the previous 3.3 mbps requirement (without contingency), than the current 0.03 mbps requirement (This new requirement remains under review).**

