

EOS Production Sites Network Performance Report: August 2011

This is a monthly summary of EOS network performance testing between production sites -- comparing the measured performance against the requirements. Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.

Highlights:

- **Mostly stable flows**
 - **GPA 3.78** (was 3.75 last month)
- **Requirements:** updated to Handbook 1.4.3 in May '09 (was 1.4.2 previously)
 - Many Requirements dropped significantly (under review)
- **Only 2 flows below "Excellent"; only 1 below "Adequate":**
 - **GSFC MODAPS-PDR to EROS ("Almost Adequate")**
- TSO (TCP Segmentation Offload) was disabled on the GES DISC test node on 3 August, with improved results in most cases

Ratings Changes:

Upgrades: ↑ GSFC MODAPS-PDR to EROS: **Low** → **Almost Adequate**

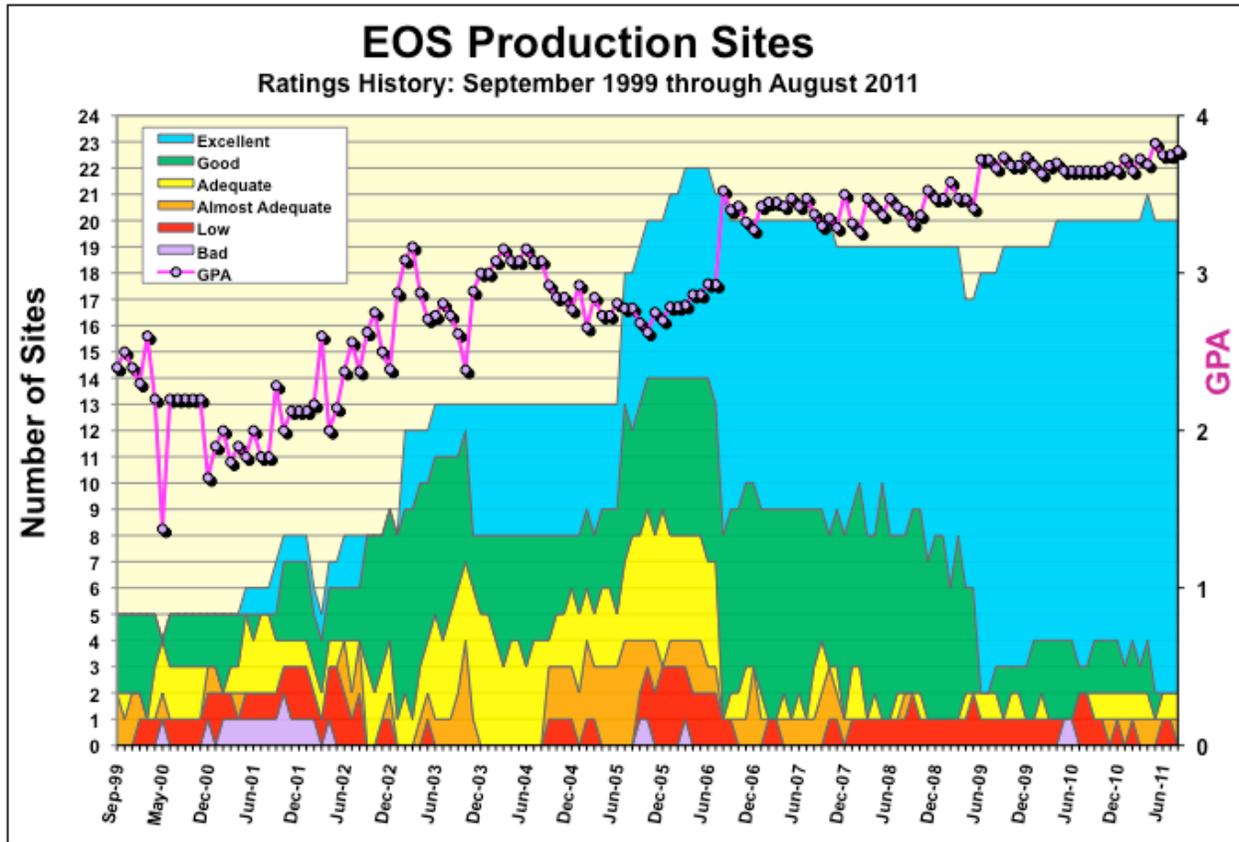
Downgrades: ↓ None

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 = Average Integrated Kbps (where available), otherwise just iperf

Ratings History:



The chart above shows the number of sites in each rating category 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.

Additions and deletions:

- 2011 April: Added RSS to GHRC
- 2011 May: Deleted WSC to ASF for ALOS

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. ESDIS is in process of reviewing its network ICD's with each instrument team. When these ICDs are completed, the database will be updated with the ICD values, and those values will be used here as well.

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

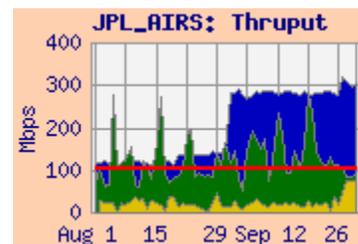
One main difference between Handbooks 1.4.2 and 1.4.3 is that most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated 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 from version 1.4.3. 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:

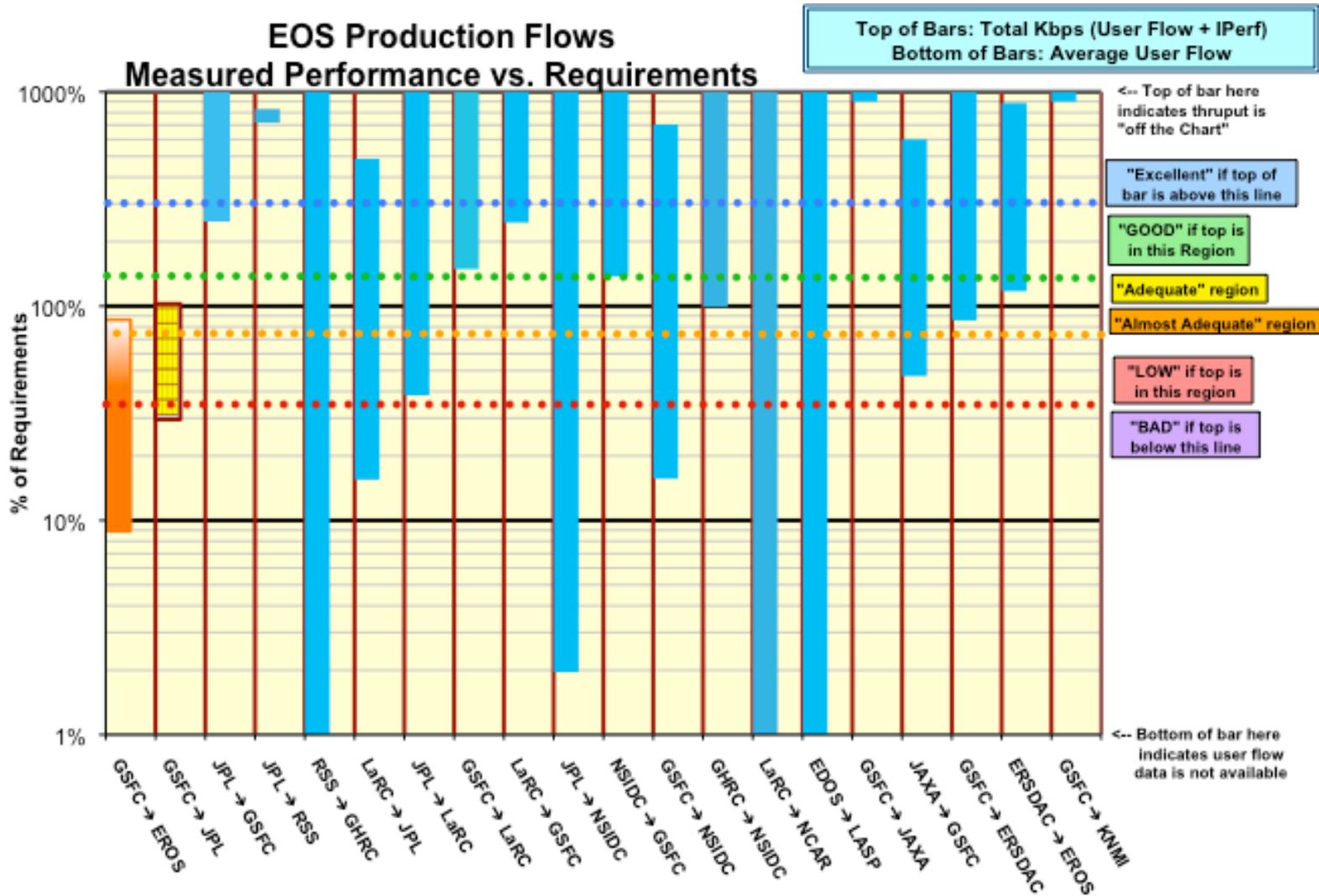
Integrated charts are included with site details, where available. These charts are "Area" charts, with a "salmon" background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to 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 – usually "behind" the green area – representing adjusted iperf measurements from a second source node at the same facility.



Network Requirements vs. Measured Performance

August 2011		Requirements (mbps)		Testing				Ratings	
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re HB 1.4.3 Requirements	
		HB 1.4.3	HB 1.4.2					This Month	Last Month
GSFC → EROS	MODIS, LandSat	342.9	345.9	MODAPS-PDR → EROS LPDAAC	30.6	292.7	296.0	AA	Low
GSFC → JPL	AIRS, MLS, ISTs	101.7	43.6	GES DISC → JPL-AIRS	30.1	96.7	104.0	Adequate	Ad
JPL → GSFC	MLS	0.6	7.4	JPL-PTH → GSFC-ESDIS-PTH	1.4	86.0	86.0	Excellent	Ex
JPL → RSS	AMSR-E	0.5	2.5	JPL-PODAAC → RSS	3.47	2.13	4.02	Excellent	Ex
RSS → GHRC	AMSR-E	0.3		RSS (Comcast) → GHRC		4.04		Excellent	Ex
LaRC → JPL	TES, MISR	69.3	43.7	LARC-ASDC → JPL-TES	10.7	337.2		Excellent	Ex
JPL → LaRC	TES	1.5	4.4	JPL-PTH → LARC-PTH	0.56	62.7		Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT	31.3	60.5	GES DISC → LaRC ASDC	46.6	465.0	465.8	Excellent	Ex
LaRC → GSFC	CERES, MODIS, TES	0.4	0.2	LARC-ASDC → GES DISC	0.88	330.8	330.8	Excellent	Ex
JPL → NSIDC	AMSR-E	0.2	1.3	JPL-PODAAC → NSIDC	0.003	34.8		Excellent	Ex
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.6	0.5	NSIDC DAAC → GES DISC	0.78	239.8	239.8	Excellent	Ex
GSFC → NSIDC	MODIS, ICESAT, QuikScat	27.6	34.5	MODAPS-PDR → NSIDC-DAAC	4.3	193.8	193.8	Excellent	Ex
GHRC → NSIDC	AMSR-E	0.5	7.5	GHRC → NSIDC DAAC (ftp)	0.47	10.9		Excellent	Ex
LaRC → NCAR	MOPITT	0.1	5.4	LARC-ASDC → NCAR		246.6		Excellent	Ex
EDOS → LASP	ICESat, QuikScat	0.4	0.4	GSFC-EDOS → LASP (blue)	0.0001	4.87		Excellent	Ex
GSFC → JAXA	QuikScat, TRMM, AMSR	0.1	2.0	GSFC → JAXA	5.0	Testing discontinued: 31 March 2009		Excellent	Ex
JAXA → GSFC	AMSR-E	0.5	1.3	JAXA → GSFC	2.9			Excellent	Ex
GSFC → ERSDAC	ASTER	5.4	12.5	GSFC-EDOS → ERSDAC	4.6	77.0	77.8	Excellent	Ex
ERSDAC → EROS	ASTER	8.3	26.8	ERSDAC → EROS PTH	9.7	73.3	73.4	Excellent	Ex
GSFC → KNMI	OMI	0.03	3.3	GSFC-OMISIPS → KNMI ODPS	3.0	91.3	91.3	Excellent	Ex
				Significant change from v 1.4.2 (5/09) to v 1.4.3				Ratings Summary	
				Value used for ratings				HB 1.4.3 Req	
								Score	Prev
*Criteria:	Excellent	Total Kbps > Requirement * 3			Excellent		18	18	
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3			Good		0	0	
	Adequate	Requirement < Total Kbps < Requirement * 1.3			Adequate		1	1	
	Almost Adequate	Requirement / 1.3 < Total Kbps < Requirement			Almost Adequate		1	0	
	Low	Requirement / 3 < Total Kbps < Requirement / 1.3			Low		0	1	
	Bad	Total Kbps < Requirement / 3			Bad		0	0	
								Total Sites	20
Notes: Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS								GPA	3.78

This graph shows a bar for each source-destination pair – relating the measurements to the requirements for that pair. The bottom of each bar represents the average measured user flow from the source site to the destination site (as a percent of the requirement) – it 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 similarly represents the integrated measurement, combining the user flow with Iperf measurements – this value is used to determine the ratings.



1) EROS:

Ratings: GSFC → EROS: ↑ **Low** → **Almost Adequate**
 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	371.8	292.7	149.5	30.6	296.0
GSFC-EDOS → EROS LPDAAC	169.3	103.6	36.4		
GES DISC → EROS LPDAAC	349.8	280.9	149.1		
ERSDAC → EROS LPDAAC	74.4	73.3	26.6	9.7	73.4
NSIDC SIDADS → EROS PTH	164.6	159.2	82.8		
GSFC-ENPL → EROS PTH	826.6	764.9	610.5		
GSFC-NISN → EROS PTH	471.4	278.2	95.9		
LaRC PTH → EROS PTH	185.8	125.3	62.9		

Requirements:

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

Comments:

1.1 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 10 gbps backbone to the NISN Chicago CIEF, then via GigE to the StarLight Gigapop, peering with the EROS tail circuit.

The user flow dropped off mid March, after about 5 months of high user flow, reportedly based on a science user at EROS acquiring MODIS data. This month it averaged only about 9% of the nominal requirement (the requirement includes MODIS reprocessing).

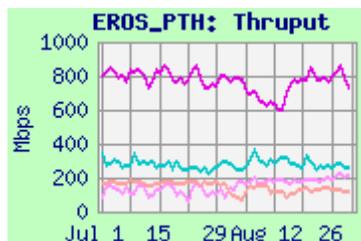
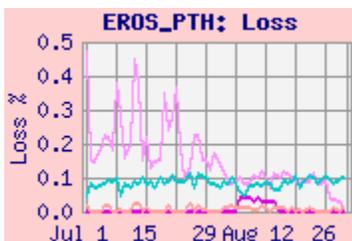
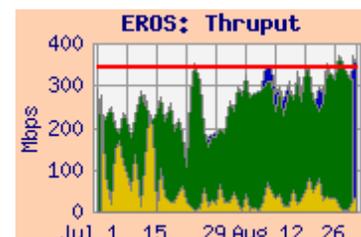
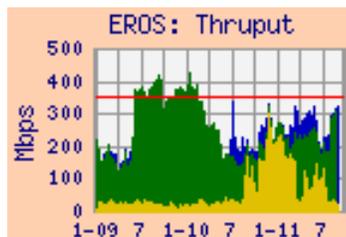
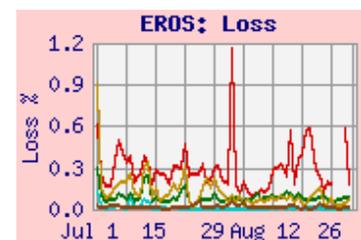
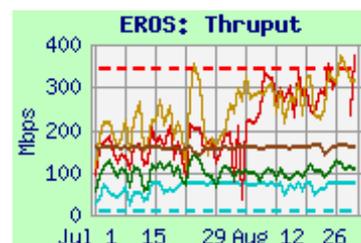
Thruput from GES DISC to LPDAAC improved due to disabling TSO on the GES DISC test node. Thruput from MODAPS-PDR to LPDAAC improved due to EBnet upgrades. The rating improves to **Almost Adequate**.

Iperf performance from GSFC-NISN and GSFC-ENPL was mostly stable since mid May. The GSFC-ENPL host has a direct connection to the MAX; its route is via MAX to Internet2 to StarLight in Chicago.

1.2 ERSDAC → EROS: **Excellent**. See section 9 (ERSDAC) for further discussion.

1.3 NSIDC → EROS-PTH: Performance was very stable after improvement with retuning in early June.

1.4 LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH was stable. The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources.



2) to GSFC

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

Web Pages:

- <http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>
- http://ensight.eos.nasa.gov/Organizations/production/ESDIS_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	208.9	164.4	84.2	
EROS PTH → GSFC-ESDIS PTH	428.7	305.5	215.0	
JPL-PTH → GSFC-ESDIS PTH	87.9	86.0	80.1	1.4
LDAAC → GES DISC	534.5	330.8	174.6	0.88
LARC-ANGe → GSFC-ESDIS PTH	471.1	405.0	343.2	
NSIDC DAAC → GES DISC	342.1	239.8	135.0	0.78
NSIDC DAAC → GSFC-ISIPS	133.9	126.2	90.0	

Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '10	0.6	Excellent
LDAAC → GES DISC	FY '07 – '10	0.4	Excellent
JPL → GSFC combined	CY '06 – 10	3.2	Excellent

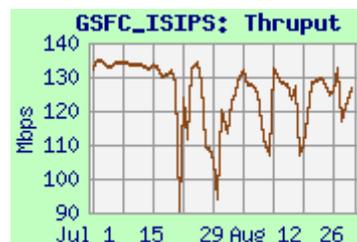
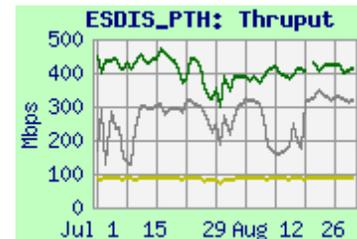
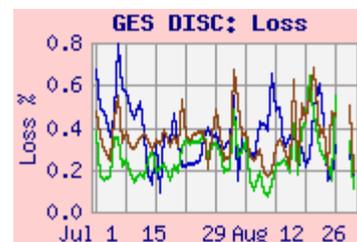
Comments: Thruput to GES DISC was noisy but relatively stable this month, similar to last month.

EROS, EROS-PTH → GSFC: The thruput for tests from EROS and EROS-PTH to GES DISC and ESDIS-PTH were mostly stable, with much better results from EROS-PTH.

JPL → GSFC: Thruput was again very stable this month. With the modest requirement (reduced from 7.4 mbps in May '09), the rating remains "Excellent". The actual user flow is consistent with the reduced requirement.

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

NSIDC → GSFC: Performance from NSIDC to GSFC (DAAC and ISIPS) was mostly steady this month. The user flow was somewhat above the low requirement (reduced from 13.3 mbps in May '09); the rating remains "Excellent".

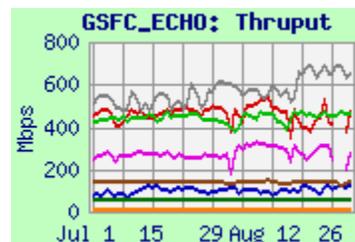


2.2 GSFC-ECHO: EOS Metadata Clearinghouse

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

Test Results:

	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	120.9	103.4	63.7
EROS LPDAAC ftp	10.6	10.1	7.2
GES DISC	521.6	468.5	290.2
GES DISC ftp	337.6	294.7	126.0
LaRC ASDC DAAC	497.9	455.6	342.2
LaRC ASDC DAAC ftp	56.1	55.4	42.9
MODIS-LADSWEB	650.6	593.4	523.7
NSIDC DAAC	141.3	137.7	123.6
NSIDC DAAC ftp	11.3	11.3	5.2



Comments:

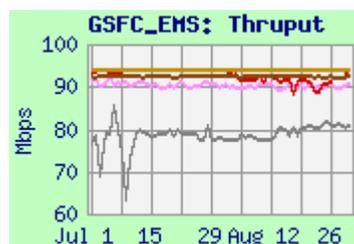
Performance was stable from all sources. Performance is mostly limited by TCP window size – especially on ftps with long RTT.

2.3 GSFC-EMS: EOS Metrics System

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

Test Results:

	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS-PTH	86.5	79.9	73.4
ESDIS-PTH	92.9	90.1	84.7
GES DISC	93.7	91.7	88.0
LARC-PTH	94.0	94.0	90.2
MODAPS-PDR	94.1	94.0	92.8
NSIDC-SIDADS	92.9	92.4	91.0



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 **Adequate**

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	121.2	96.7	47.3	30.1	104.0
GSFC-NISN → JPL-AIRS	295.7	284.5	194.5		
ESDIS-PTH → JPL-AIRS	244.7	217.0	151.5		
GSFC-NISN → JPL-PODAAC	67.0	58.2	31.0		
ESDIS-PTH → JPL-PODAAC	65.2	56.7	40.7		
GSFC-NISN → JPL-QSCAT	87.2	84.1	77.3		
ESDIS-PS → JPL-QSCAT	91.9	88.5	75.6		
ESDIS-PTH → JPL-QSCAT	80.2	74.2	53.6		
GSFC-NISN → JPL-MLS	283.1	261.0	178.6		
ESDIS-PTH → JPL-MLS	249.6	206.6	141.0		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	FY '08-'10	101.7	Adequate
GSFC → JPL AIRS	FY '08-'10	98	Adequate
GSFC → JPL PODAAC	FY '08-'11	1.5	Excellent
GSFC → JPL QSCAT	FY '08-'11	0.6	Excellent
GSFC → JPL MLS	FY '08-'10	2.1	Excellent

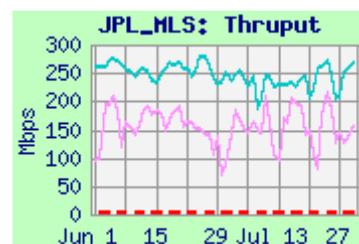
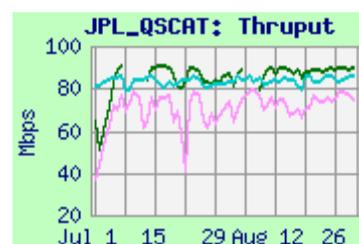
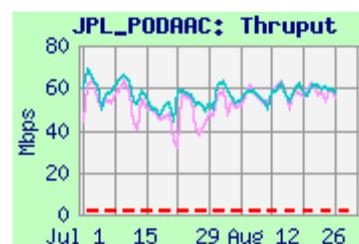
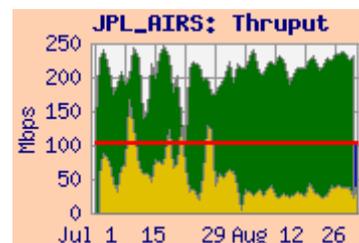
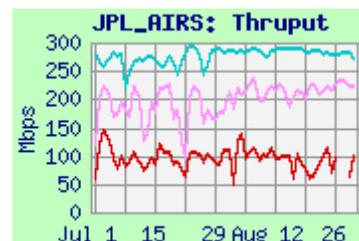
Comments: The user flow from GSFC/EOS to JPL combined was much lower – back to normal -- this month, after being higher than usual in July.

AIRS, Overall: Integrated thrupt from GES DISC dropped to only 6 % above the AIRS requirement, so the AIRS rating remains **Adequate**. The **JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the thrupt is also below 1.3 x this requirement, so the overall rating also remains **Adequate**.

PODAAC: The PODAAC node was switched in May – testing to the new node began mid May; thrupt is somewhat lower than to the old node. Performance is stable and way above the 1.5 mbps PODAAC requirement, rating **Excellent**.

QSCAT: Thuput from ESDIS-PTH to QSCAT improved around 1 June (by disabling TSO) to be very similar to GSFC-NISN, and remains well above the modest requirement, rating **Excellent**. User flow from GSFC to QSCAT averaged only about 1.1 kbps again this month.

MLS: Thrupt from ESDIS-PTH was mostly stable, but thrupt was much better from GSFC-NISN. The rating remains **Excellent**.



3.2) LaRC → JPL

Rating: 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)			User Flow	Integrated
	Best	Median	Worst		
LaRC DAAC → JPL-TES	451.6	337.2	91.1	0.03	337.2
LaRC PTH → JPL-TES	175.8	147.5	119.0		
LaRC PTH → JPL-TES sftp	3.08	3.06	2.97		
GSFC-NISN → JPL-TES sftp	3.19	3.17	3.13		
LaRC ANGE → JPL-PTH	78.8	74.7	73.4	4.6	74.8
LaRC PTH → JPL-PTH	65.7	46.5	27.0		
LaRC PTH → JPL-PTH sftp	31.8	31.8	31.0		
LaRC DAAC → JPL-MISR	73.4	61.9	34.3	4.2	62.4
LaRC PTH → JPL-MISR	88.5	80.7	35.6		

Requirements:

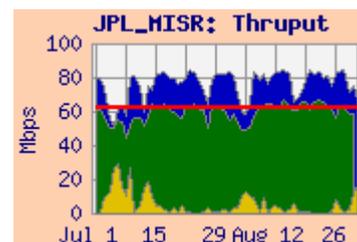
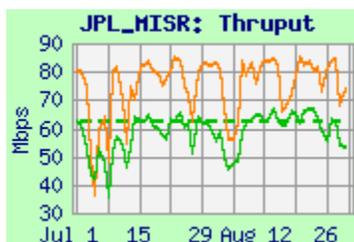
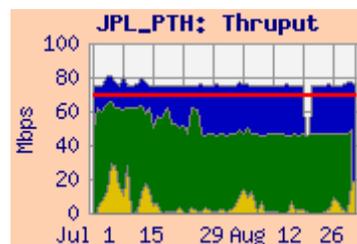
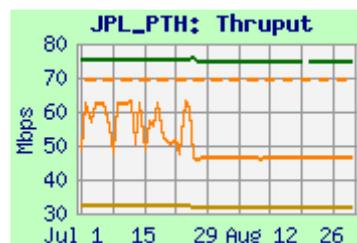
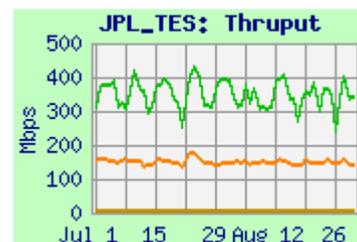
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 –	7.0	Excellent
LaRC DAAC → JPL-MISR	FY '07 –	62.3	Adequate
LaRC → JPL-Combined	FY '07 –	69.3	Excellent

Note: The overall LaRC → JPL flow was lower than last month, averaging 4.6 mbps (was 7.5 mbps last month). About 88% of the LaRC to JPL flow this month was for MISR. The JPL-PTH integrated graph shows the overall LaRC to JPL user flow (vs. the overall requirement).

LaRC → JPL (Overall, TES): The TES node was upgraded in March '11, with improved thrupt. 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". User flow to TES is very low.

Sftp performance from LaRC-PTH to JPL-TES is quite low, apparently limited by the Sftp server on the TES node. An additional Sftp test to JPL-TES from GSFC-NISN (not graphed), gets similar poor results to LaRC-PTH. The Sftp window size on the new TES node is quite large, and is thus not the problem. Instead, it appears that the TES sftp application is throttling the sender. Note that Sftp results are much better from LaRC-PTH to JPL-PTH (than to TES), even though iperf results from the same source are better to TES than JPL-PTH.

LaRC → JPL (MISR): The thrupt was mostly stable, limited by the MISR Fast-E connection. It is now slightly ABOVE the new requirement, so the MISR rating improves to Adequate. The average user flow to MISR was only about 7% of the new requirement.



3.3) JPL → LaRC

Rating: Continued Excellent

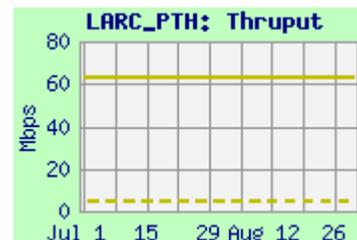
Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
JPL-PTH → LaRC PTH	63.0	62.7	62.5	0.56	62.7

Requirements:

Source → Dest	Date	Mbps	Rating
JPL-PTH → LaRC PTH	FY '07 – '10	1.5	Excellent



Comment: 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 '09 (and had been reduced in April '08 from 52.6 mbps). This month the thrupt was again stable at the lower of its two common states – 63 and 85 mbps. The rating remains “**Excellent**”. The small user flow was consistent with the requirement.

4) 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 → LaRC ASDC	530.8	465.0	333.2	46.6	465.8
GSFC-EDOS → LaRC ASDC	153.2	127.9	39.9		
ESDIS-PTH → LaRC-ANGe	436.6	401.5	317.6		
GSFC-NISN → LaTIS	471.8	448.7	281.7		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '09 – '11	31.3	Excellent

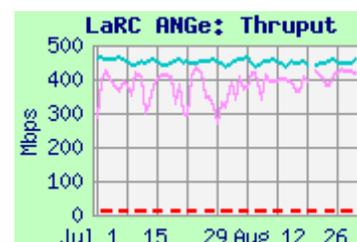
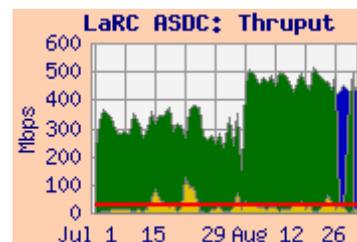
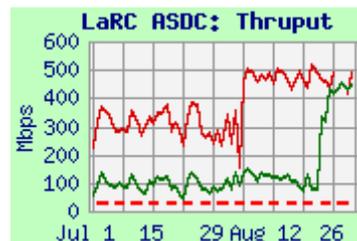
Comments:

GSFC → LaRC ASDC: The rating is based on the **GES DISC** to LaRC ASDC DAAC thrupt, compared to the combined requirement. The integrated thrupt increased this month, due to disabling of TSO on GES DISC. It remains well above 3 x this requirement, so the rating remains “**Excellent**”.

Thrupt to ASDC from **GSFC-EDOS** was much lower until it was retuned in mid August, with improved results.

As seen on the integrated graph, the user flow was steady, and higher than usual this month, even higher than the requirement.

ANGe (LaTIS): Testing to ANGe from **ESDIS-PTH** gets steady performance. Testing to LaTIS (Darrin) from **GSFC-NISN** was similar, with very consistent results.



5) Boulder CO sites:

5.1) 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 was disconnected from NISN PIP in December '09 – all flows now go via the UCB campus, usually via FRGP to Internet2 or NLR. Thus the DAAC competes with the students for network capacity, and there was often significant diurnal variation. DAAC performance improved and stabilized at the end of April, when the school year ended and most of the students left.

NSIDC reports that the circuit from UCB to FRGP was increased from 1 gbps to 10 gbps on approx 10 July. No performance change was observed at that time, however.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → NSIDC DAAC	221.3	193.8	142.0	4.3	193.8
GES-DISC → NSIDC DAAC	172.6	152.1	76.3		
GSFC-EDOS → NSIDC DAAC	127.5	103.1	30.1		
GSFC-ISIPS → NSIDC (iperf)	132.2	111.8	78.1		
JPL PODAAC → NSIDC DAAC	36.6	34.8	33.1		

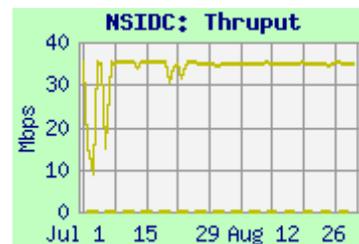
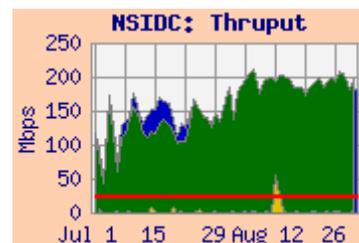
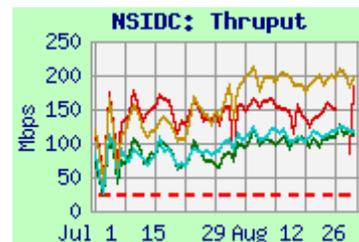
Requirements:

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, since this is the primary production flow. The requirement was reduced in May '09 from 34.5 mbps (and was 64 mbps in April '08). Thruput from GES DISC to NSIDC improved a bit this month due to disabling of TSO on the GES DISC test node. Thruput from MODAPS-PDR to NSIDC improved due to EBnet upgrades.

The integrated thruput from MODAPS remains above the requirement, by more than 3x, so the rating remains "Excellent". The user flow was higher than last month (1.6 mbps), due mostly to a short peak. It remains less than 20% of the reduced requirement. Testing from other GSFC sources, including GES DISC, EDOS, and ISIPS, is similar to MODAPS.

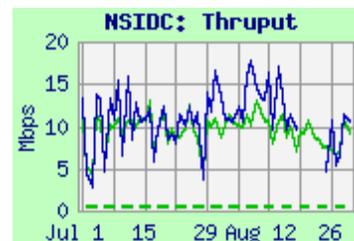
JPL PODAAC → NSIDC S4PA: The requirement was reduced from 1.34 mbps in May '09. Thruput from PODAAC to NSIDC has been mostly stable with a similar diurnal cycle since testing was moved to use Internet2 in September '09; the rating remains "Excellent".



5) Boulder CO sites (Continued):

5.1) NSIDC: (Continued): Test Results: GHRC to NSIDC

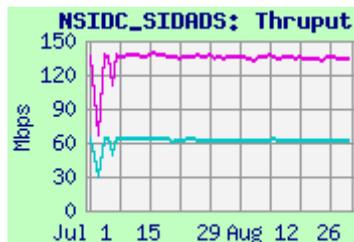
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GHRC → NSIDC DAAC (nuttcp)	18.9	9.8	4.0
GHRC → NSIDC DAAC (ftp pull)	47.9	10.9	3.9



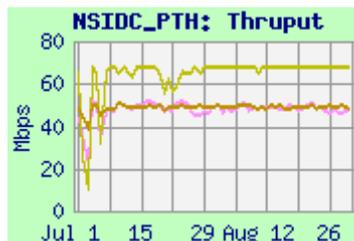
GHRC, GHRC-ftp → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E data to NSIDC via NLR / Internet2. The rating is now based on this reverse nuttcp testing. The median nuttcp thrupt is more than 3x the 0.5 mbps requirement, so the rating remains "Excellent".

Test Results: NSIDC SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	141.4	135.4	127.7
GSFC-NISN → NSIDC-SIDADS	62.7	62.6	61.2
ESDIS-PTH → NSIDC-PTH	52.2	48.1	37.3
MODAPS-PDR → NSIDC-PTH	54.3	49.1	44.8
JPL PTH → NSIDC-PTH	67.6	67.5	52.1



GSFC → NSIDC-SIDADS: Thrupt via Internet2 to SIDADS from ENPL and GSFC-NISN was very steady. Thrupt from GSFC-NISN, ESDIS-PTH, and JPL dropped at the end of January due to increased RTT from the NLR to I2 switch.



NSIDC-PTH: Thrupt from ESDIS-PTH improved in early June due to turning TSO off on ESDIS-PTH. Testing to NSIDC-PTH had also previously displayed diurnal variation.

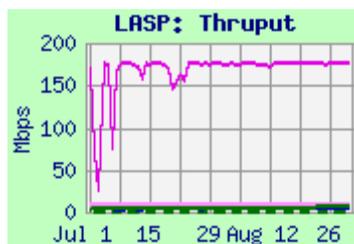
5.2) LASP:

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	7.64	4.87	2.12
ESDIS-PTH → LASP blue (iperf)	9.30	9.02	8.34
ESDIS-PTH → LASP blue (scp)	3.78	3.69	2.73
GSFC ENPL → LASP green	176.6	175.8	152.9

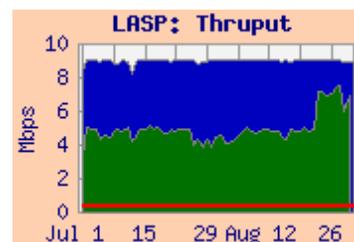


Requirement:

Source → Dest	Date	Mbps	Rating
GSFC-EDOS → LASP (blue)	CY '07 – '10	0.4	Excellent

Comments: In mid January '11, LASP's connection to NISN PIP was rerouted: it previously was 100 mbps from CU-ITS via NSIDC; this was changed to a 10 mbps connection to the NISN POP in Denver.

Thrupt was consistent with the new circuit limitation. The median thrupt from EDOS remained well over 3x the requirement, so the rating remains "Excellent". Performance improved in late August due to retuning. The average user flow this month was typical at 0.1 kbps, way below the requirement.

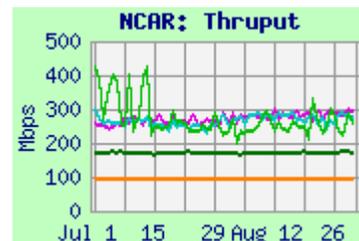


ESDIS-PTH also tests to the test node on LASP's blue network. Thrupt improved around 1 June due to disabling of TSO on ESDIS-PTH. SCP performance from ESDIS-PTH to LASP was also very steady.

Performance from GSFC-ENPL to a node on LASP's green network via Internet2 / UCB was much higher, and was no longer subject to congestion from students -- like NSIDC systems.

5) Boulder CO sites (Continued):**5.3) NCAR:**Ratings: LaRC → NCAR: Continued **Excellent**Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>**Test Results:**

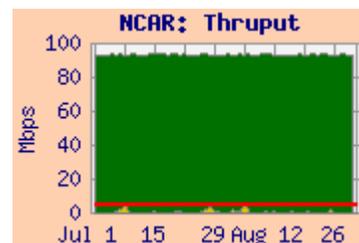
Source	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
LaRC ASDC	402.2	246.6	163.9	0.1
LaRC PTH	182.2	172.2	133.9	
GSFC-ENPL-GE	358.7	283.2	206.3	n/a
GSFC-ENPL-FE	93.6	93.5	93.4	
GSFC-NISN	341.6	275.0	154.6	



Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements.

Thruput from **LaRC ASDC** was somewhat noisy (2.5:1 best : worst ratio), but the median (also daily worst) remained well above 3 x the requirement, so the rating remains "**Excellent**".

From **GSFC-NISN**, the route is via NISN to the MAX (similar route and performance as from LaRC). From **GSFC-ENPL-GE**, with a Gig-E connection to MAX, the median thruput was about the same. Performance from all sources is somewhat noisy but mostly stable. The average user flow from GSFC this month was 0.9 mbps, typical of recent months.

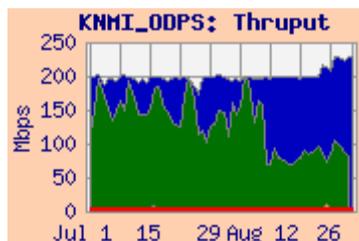
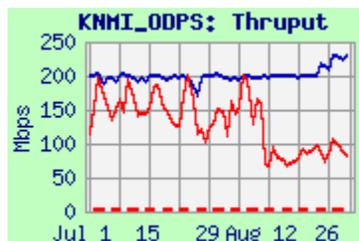
**6) KNMI:**Rating: Continued **Excellent**Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
OMISIPS → KNMI-ODPS	160.1	91.3	52.9	0.03
GSFC-ENPL → KNMI-ODPS	204.4	199.3	172.8	

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 again based on the results from **OMISIPS** at GSFC to the ODPS primary server. The thruput decreased in mid August, but remained much more than the tiny requirement, so the rating remains "**Excellent**". Thruput was higher and improved from **GSFC-ENPL** in late August (outside the ESDIS firewall).

The user flow averaged 3.0 mbps this month, (hard to see on the integrated graph). This is consistent with the previous 3.3 mbps requirement, but is much more than the current 0.03 mbps requirement (This new requirement remains under review). The rating would still be "**Excellent**" compared with a requirement of 3.3 mbps.



7) Remote Sensing Systems (RSS): Ratings: JPL → RSS: Continued **Excellent**
 RSS → GHRC: Continued **Excellent**

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integ.	Req
	Best	Median	Worst			
JPL → RSS (NISN)	4.70	2.13	0.55	3.47	4.02	0.49
JPL → RSS (Comcast)	40.8	39.9	36.2			
RSS (Comcast) → GHRC (UAH)	5.07	4.04	1.37			0.34
RSS (Comcast) → GHRC (NISN)	4.46	3.62	1.63			

Comments: RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving L1 data from JAXA via JPL, and sending its processed L2 results to GHRC (aka NSSTC) (UAH, Huntsville, AL).

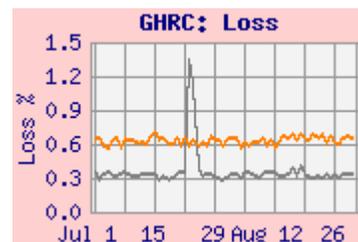
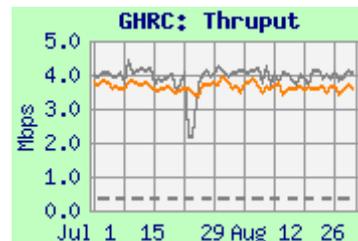
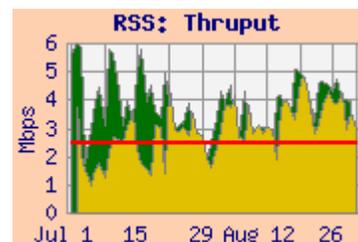
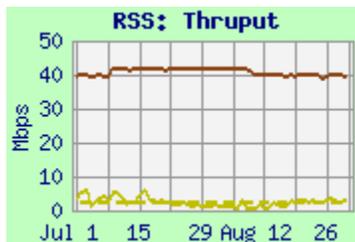
RSS currently is using a NISN SIP circuit: 4 x T1s to NASA ARC (total 6 mbps). User flow data on this circuit is now being

obtained from the NISN SIP router at ARC. The integrated graphs show that periods of low iperf performance are attributable to higher user flow. 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**”.

In April a new Comcast circuit was installed, rated at 50 mbps incoming, and 12 mbps outgoing. Testing from JPL began on this circuit in April, with results consistent with the specs, as shown above.

RSS → GHRC: In addition, the new server at RSS connected to the Comcast circuit allows “3rd party testing”, as does the server at GHRC. Testing has therefore been initiated from RSS to GHRC, with results around 4 mbps, both to a UAH address and a NISN address at GHRC. Either result yields a rating of “**Excellent**” re the 0.34 mbps requirement.

Plans are being developed to switch the production flows to the Comcast circuit, leading to the removal of the T1s.



8) ERSDAC:

Ratings: **GSFC → ERSDAC:** Continued **Excellent**
ERSDAC → EROS: Continued **Excellent**
ERSDAC → JPL-ASTER-IST: 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	77.0	28.4	4.6	77.8
GES DISC → ERSDAC	45.0	40.2	22.9		
GSFC ENPL (FE) → ERSDAC	89.6	89.4	89.4		
ERSDAC → EROS	74.4	73.3	26.6	9.7	
ERSDAC → JPL-ASTER IST	90.0	89.8	89.5		

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

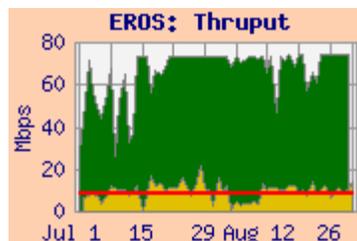
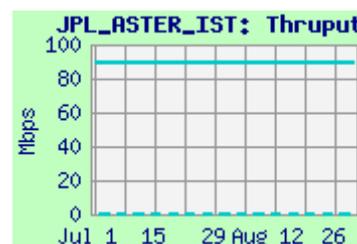
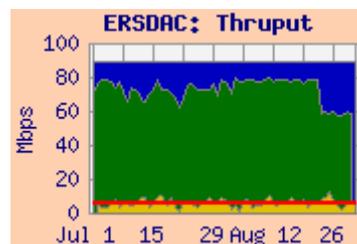
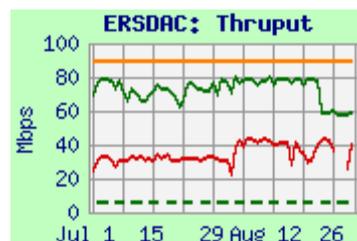
Comments:

GSFC → ERSDAC: The median thrupt from EDOS remains well above 3 x the reduced requirement; 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). It 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. EDOS uses QoS (HTB) to limit its burst rate, and thus gets much better thrupt that GES DISC – thrupt similar to ENPL-FE.

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 thrupt is mostly stable and remains well above the reduced requirement (was 26.8 mbps previously). The new 8.3 mbps requirement is much closer to the actual flow user flow (which was very high this month). The median thrupt is more than 3 x the reduced requirement, so the rating remains “Excellent”.



9) US ↔ JAXA

Ratings: **US → JAXA: Continued Excellent**
JAXA → US: Continued Excellent

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009 (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 '09.

However, the user flow between GSFC and JAXA continues to be measured. As shown below, the user flow this month averaged 2.1 mbps from GSFC to JAXA (with frequent peaks above 5 mbps), and 92 kbps from JAXA to GSFC (with regular peaks to 2.8 mbps). Comparing these values to the new requirement of 0.1 mbps produces a rating of "Excellent" in both directions. Note that the user flow to JAXA is much more consistent with the old 2.0 mbps GSFC → JAXA requirement.

