EOS Production Sites
Network Performance Report: June 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 3.75** (was 3.83 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** ("**Low**")
    - Meets requirement without contingency

Ratings Changes:

Upgrades: ↑ None

Downgrades: ↓

GSFC MODAPS-PDR → EROS: Almost Adequate → Low

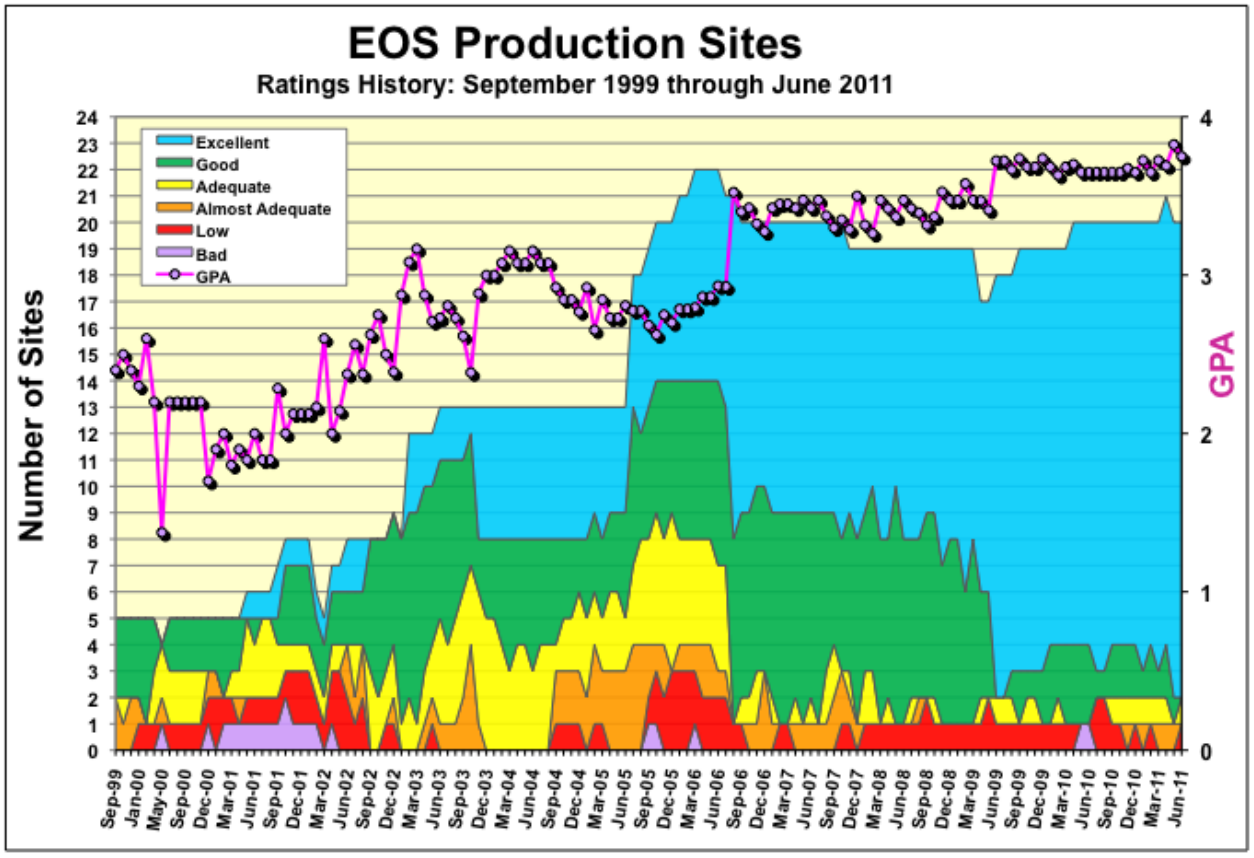
GSFC → JPL: Good → Adequate

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 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.

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.

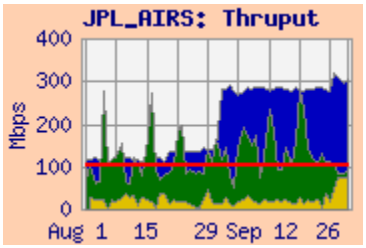
Until then, the requirements are based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Previously, the requirements were derived from version 1.4.2.

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 thruput 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

June 2011		Requirements (mbps)		Testing				Ratings	
Source → Destination	Instrument (s)	Current HB 1.4.3	Old HB 1.4.2	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re HB 1.4.3 Requirements: This Month	Last Month
GSFC → EROS	MODIS, LandSat	342.9	345.9	MODAPS-PDR → EROS LPDAAC	98.7	176.8	201.5	Low	A A
GSFC → JPL	AIRS, MLS, ISTs	101.7	43.6	GES DISC → JPL-AIRS	31.5	101.5	117.9	Adequate	Good
JPL → GSFC	MLS	0.6	7.4	JPL-PTH → GSFC-ESDIS-PTH	1.7	85.7	85.7	Excellent	Ex
JPL → RSS	AMSR-E	0.5	2.5	JPL-PODAAC → RSS	3.1	3.3	4.6	Excellent	Ex
RSS → GHRC	AMSR-E	0.3		RSS (Comcast) → GHRC		4.1		Excellent	Ex
LaRC → JPL	TES, MISR	23.0	43.7	LARC-ASDC → JPL-TES	4.5	367.9		Excellent	Ex
JPL → LaRC	TES	1.5	4.4	JPL-PTH → LARC-PTH	1.59	63.2		Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT	31.3	60.5	GSFC-EDOS → LaRC ASDC	12.2	100.4	100.4	Excellent	Ex
LaRC → GSFC	CERES, MODIS, TES	0.4	0.2	LARC-ASDC → GES DISC	0.47	318.2	318.2	Excellent	Ex
JPL → NSIDC	AMSR-E	0.2	1.3	JPL-PODAAC → NSIDC	0.009	35.0		Excellent	Ex
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.6	0.5	NSIDC DAAC → GES DISC	0.64	240.9	240.9	Excellent	Ex
GSFC → NSIDC	MODIS, ICESAT, QuikScat	27.6	34.5	MODAPS-PDR → NSIDC-DAAC	1.4	122.8	122.8	Excellent	Ex
GHRC → NSIDC	AMSR-E	0.5	7.5	GHRC → NSIDC DAAC (ftp)	0.49	10.4		Excellent	Ex
LaRC → NCAR	MOPITT	0.1	5.4	LARC-ASDC → NCAR		324.6		Excellent	Ex
EDOS → LASP	ICESat, QuikScat	0.4	0.4	GSFC-EDOS → LASP (blue)	0.0002	4.6		Excellent	Ex
GSFC → JAXA	QuikScat, TRMM, AMSR	0.1	2.0	GSFC → JAXA	4.0	Testing discontinued:		Excellent	Ex
JAXA → GSFC	AMSR-E	0.5	1.3	JAXA → GSFC	2.9	31 March 2009		Excellent	Ex
GSFC → ERSDAC	ASTER	5.4	12.5	GSFC-EDOS → ERSDAC	4.6	76.4	76.5	Excellent	Ex
ERSDAC → EROS	ASTER	8.3	26.8	ERSDAC → EROS PTH	13.3	60.8	63.2	Excellent	Ex
GSFC → KNMI	OMI	0.03	3.3	GSFC-OMISIPS → KNMI ODPS	2.4	144.8	146.1	Excellent	Ex

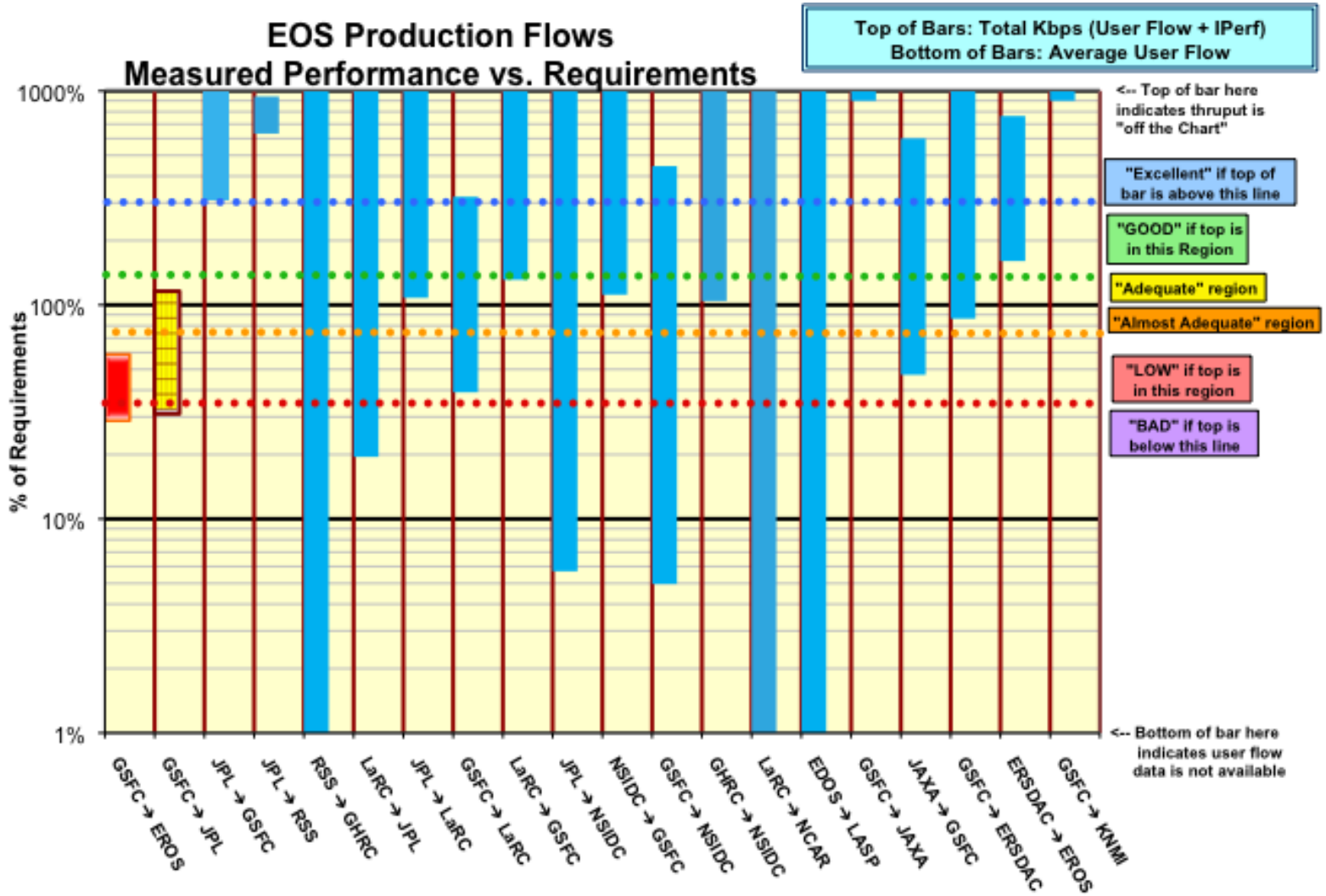
Significant change from v 1.4.2 (5/09) to v 1.4.3
Value used for ratings

*Criteria:		
	Excellent	**Total Kbps** > Requirement * 3
	Good	1.3 * Requirement <= **Total Kbps** < Requirement * 3
	Adequate	Requirement < **Total Kbps** < Requirement * 1.3
	Almost Adequate	Requirement / 1.3 < **Total Kbps** < Requirement
	Low	Requirement / 3 < **Total Kbps** < Requirement / 1.3
	Bad	**Total Kbps** < Requirement / 3

Notes: Flow Requirements include:
TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS

Ratings Summary	HB 1.4.3 Req Score	HB 1.4.3 Req Prev
Excellent	18	18
Good	0	1
Adequate	1	0
Almost Adequate	0	1
Low	1	0
Bad	0	0
Total Sites	20	20
GPA	3.75	3.83

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.



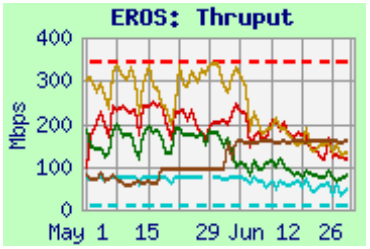
1) EROS:

Ratings: GSFC→ EROS: ↓ Almost Adequate → **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:

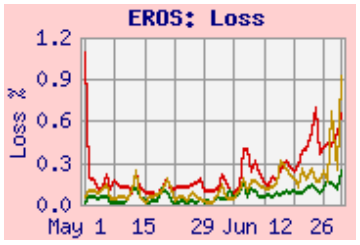
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS-PDR→ EROS LPDAAC	255.8	176.8	101.1	98.7	208.6
GSFC-EDOS → EROS LPDAAC	144.5	91.8	30.3		
GES DISC → EROS LPDAAC	235.1	170.8	83.9		
ERSDAC→ EROS LPDAAC	73.7	60.8	21.1	13.3	63.2
NSIDC SIDADS→ EROS PTH	162.1	157.8	108.1		
GSFC-ENPL → EROS PTH	845.0	795.5	680.1		
GSFC-NISN → EROS PTH	455.3	284.6	89.2		
LaRC PTH→ EROS PTH	188.7	170.0	103.5		



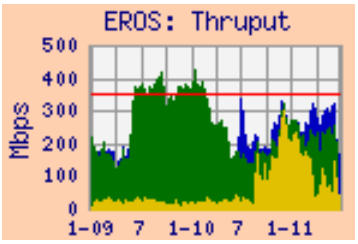
Requirements:

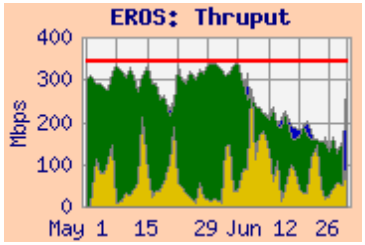
Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08-11	343	Low
ERSDAC → EROS	FY '06 –'10	8.3	Excellent

Comments:



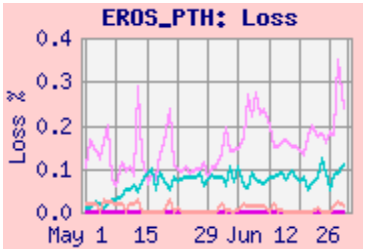
1.1 GSFC → EROS: The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement, since that is the primary flow. The route is via the Doors to NISN SIP, via the NISN 10 gbps backbone to the NISN Chicago CIEF, then via GigE to the StarLight Gigapop, peering with the EROS tail circuit. EROS upgraded this tail circuit from OC-12 (622 mbps) to OC-48 (2.5 gbps) on March 4, 2011 – Performance improved from most sources at that time.

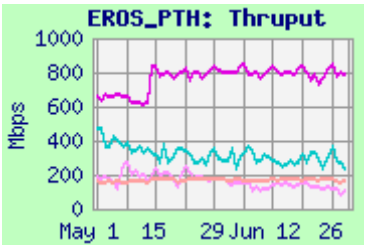




The user flow dropped off mid March, after about 5 months of high user flow, reportedly based on a science user at EROS acquiring MODIS data. This month it averaged only about 29% of the nominal requirement (the requirement includes MODIS reprocessing).

Thruput from all sources to LPDAAC declined this month, dropping the rating to **Low**. But this drop was not due to increased inflow. Iperf performance to EROS-PTH was stable, so the inference is that the decline was specific to the DAAC. Note that the packet loss increased as thruput dropped, while loss was stable to EROS-PTH.





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 improvement observed 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:

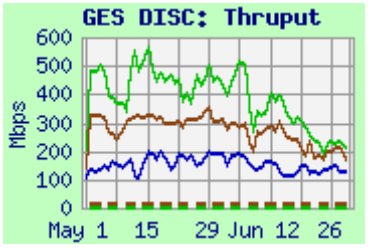
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtml
http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml

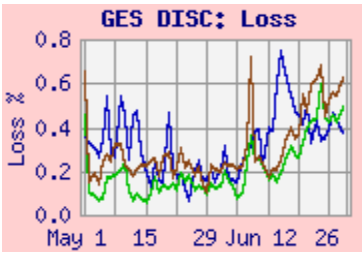
Test Results:

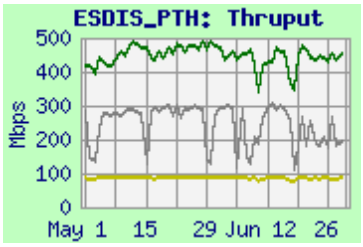
Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**User Flow**
EROS LPDAAC → GES DISC	195.0	139.4	80.7	
EROS PTH→ GSFC-ESDIS PTH	363.1	250.8	118.3	
JPL-PTH→ GSFC-ESDIS PTH	88.2	85.7	79.1	1.7
LDAAC → GES DISC	413.7	318.2	186.3	0.47
LARC-ANGe → GSFC-ESDIS PTH	523.2	443.4	368.2	
NSIDC DAAC → GES DISC	304.5	240.9	134.1	0.64
NSIDC DAAC → GSFC-ISIPS	135.1	123.9	72.5	

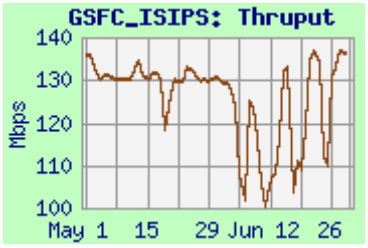
Requirements:

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 declined throughout June, as packet loss increased. But no similar drop was observed to ESDIS-PTH, also on EBnet.

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

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.

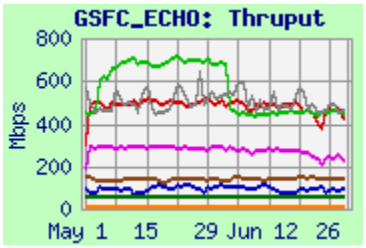
NSIDC → GSFC: Performance from NSIDC to GSFC (DAAC and ISIPS) was mostly steady this month. The user flow was close to the low requirement (reduced from 13.3 mbps in May '09); the rating remains "**Excellent**".

2.2 GSFC-ECHO: EOS Metadata Clearinghouse

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

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS LPDAAC	117.3	94.7	50.5
EROS LPDAAC ftp	10.4	10.1	7.3
GES DISC	514.9	476.6	338.2
GES DISC ftp	288.8	271.8	161.4
LaRC ASDC DAAC	502.2	449.7	405.0
LaRC ASDC DAAC ftp	59.0	58.0	32.3
MODIS-LADSWEB	578.2	488.5	443.2
NSIDC DAAC	143.7	140.4	91.4
NSIDC DAAC ftp	11.4	11.3	6.8



Comments:

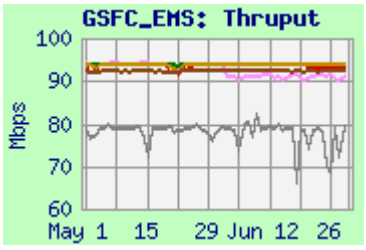
Performance was stable from all sources. Thruput from NSIDC improved in January with the route change from NLR to Internet2. Performance is mostly limited by TCP window size – especially on ftp with long RTT.

2.3 GSFC-EMS: EOS Metrics System

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

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS-PTH	89.4	78.6	67.6
ESDIS-PTH	93.9	91.0	84.9
GES DISC	93.8	93.7	91.2
LARC-PTH	94.1	94.0	91.6
MODAPS-PDR	94.1	94.0	92.7
NSIDC-SIDADS	92.9	92.4	90.2



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:

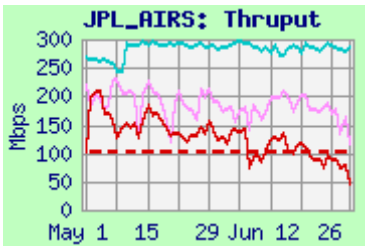
3.1) GSFC → JPL:

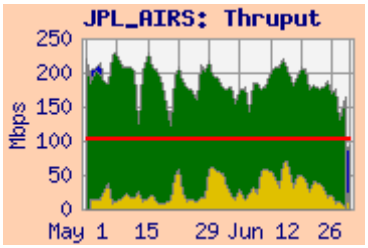
Ratings: GSFC → JPL: ↓ Good → **Adequate**

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:

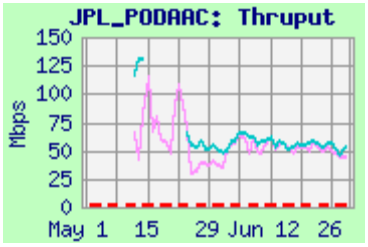
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-GES DISC→ JPL-AIRS	144.4	101.5	55.5	31.5	117.9
GSFC-NISN → JPL-AIRS	298.9	285.9	183.3		
ESDIS-PTH → JPL-AIRS	215.3	175.6	116.2		
GSFC-NISN → JPL-PODAAC	67.3	56.4	34.4		
ESDIS-PTH → JPL-PODAAC	65.5	52.1	38.6		
GSFC-NISN → JPL-QSCAT	88.0	84.5	78.0		
ESDIS-PS → JPL-QSCAT	91.6	88.4	75.3		
ESDIS-PTH → JPL-QSCAT	80.6	74.8	55.8		
GSFC-NISN → JPL-MLS	283.2	257.6	123.4		
ESDIS-PTH → JPL-MLS	207.9	159.1	99.5		





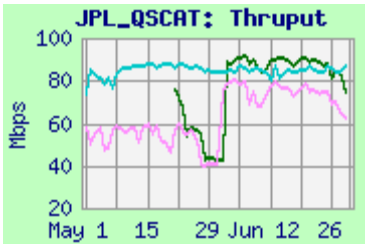
Requirements:

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**



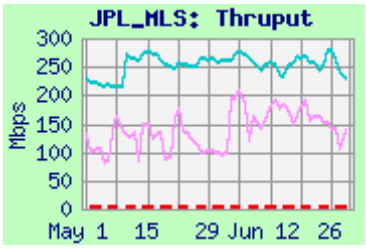
Comments: The user flow from GSFC/EOS to JPL combined was a bit higher this month than the last 2 months).

AIRS, Overall: Thruput from GES DISC dropped to only 1.2 1.5 x the AIRS requirement, so the AIRS rating drops to **Adequate**. **The JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the thruput is also below 1.3 x this requirement, so the overall rating also drops to **Adequate**. Testing to JPL-AIRS was retuned in April, with a big improvement from GSFC-NISN.



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

QSCAT: Thuput from ESDIS-PTH to QSCAT improved around 1 June to be very similar to GSFC-NISN, and remains well above the modest requirement, rating "**Excellent**". The improvement was primarily due to disabling "TSO" on the ESDIS-PTH node. TSO allows the software driver to send very large packets (larger than the MSS) to the ethernet adapter, which then breaks the large packet into a number of smaller ones. The problem is that these small packets are sent out by the ethernet adapter at maximum speed. This sometimes overloads the next element (switch or router) in the circuit, which then drops a packet, reducing thruput. Disabling TSO provides more time between packets, allowing the next element time to respond. User flow from GSFC to QSCAT averaged only about 1.2 kbps again this month.



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

3.2) LaRC → JPL

Rating: Continued **Excellent**

Web Pages:

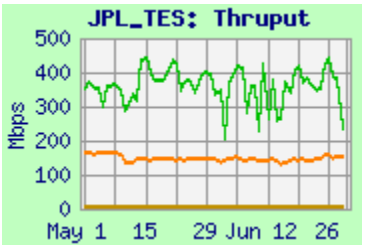
http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtml
http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml

Test Results:

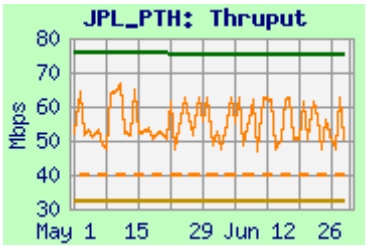
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
LaRC DAAC → JPL-TES	461.4	367.0	147.6	0.07	367.0
LaRC PTH → JPL-TES	164.3	144.5	118.5		
LaRC PTH → JPL-TES sftp	3.7	3.6	3.3		
GSFC-NISN → JPL-TES sftp	3.2	3.2	3.1		
LaRC ANGE → JPL-PTH	78.3	75.5	68.7	4.2	75.5
LaRC PTH → JPL-PTH	66.5	55.6	41.8		
LaRC PTH → JPL-PTH sftp	32.1	32.1	31.3		
LaRC DAAC → JPL-MISR	70.0	58.6	37.3	3.5	59.6
LaRC PTH → JPL-MISR	86.1	75.8	40.7		

Requirements:

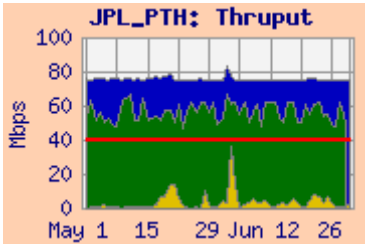
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '10	7.0	**Excellent**
LaRC DAAC → JPL-MISR	FY '07 – '10	32.9	**Good**
LaRC → JPL-Combined	FY '07 – '10	39.9	**Excellent**



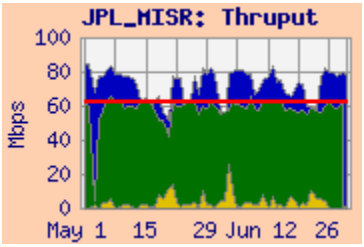
Note: The overall LaRC → JPL flow was steady, averaging 4.2 mbps (was 4.0 mbps last month). About 83% of the LaRC to JPL flow this month was for MISR. The JPL-PTH integrated graph shows the overall LaRC to JPL user flow (vs. the overall requirement).



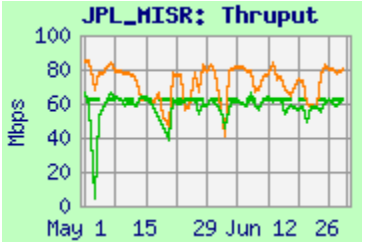
LaRC→ JPL (Overall, TES): The TES node was upgraded in March '11, with improved thruput. Median performance from LaRC ASDC DAAC to JPL-TES remains well over 3 x the TES and combined requirements, so the TES and Overall ratings remain "**Excellent**". User flow to TES is very low.



Sftp performance from LaRC-PTH to JPL-TES is quite low, apparently limited by the Sftp application on the TES node. An additional Sftp test to JPL-TES was initiated from GSFC-NISN (Not graphed), with similar poor results to LaRC-PTH. It has been determined that the Sftp window size on the new TES node is quite large, and 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 median thruput is above the requirement, by more than 30%, so the MISR rating remains "**Good**". The average user flow to MISR was similar to the 3.2 mbps last month, and is only about 10.5% of the requirement.



3.3) JPL → LaRC

Rating: Continued **Excellent**

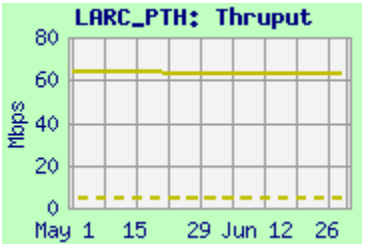
Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
JPL-PTH → LaRC PTH	63.5	63.2	62.9	1.59	63.2

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 thruput was stable at the lower of its two common states – 64 and 85 mbps. The rating remains "**Excellent**". The small user flow was consistent with the requirement.

---

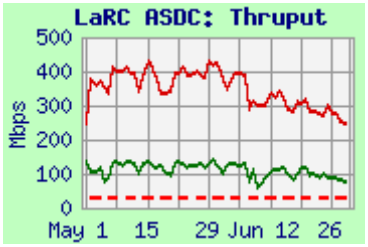
4) GSFC → LaRC:

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)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GES DISC → LaRC ASDC	361.3	302.3	209.3	12.2	304.7
GSFC-EDOS → LaRC ASDC	149.9	100.4	32.3		
ESDIS-PTH → LaRC-ANGe	448.9	411.3	320.3		
GSFC-NISN → LaTIS	478.9	460.5	272.7		

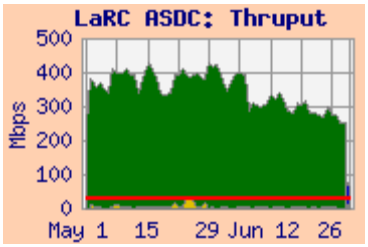


Requirements:

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

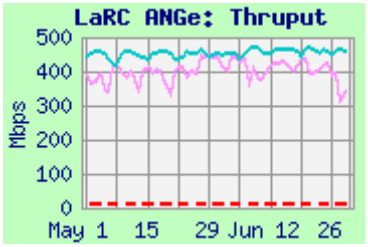
Comments:

GSFC → LaRC ASDC: The rating is based on the GES DISC to LaRC ASDC DAAC thruput, compared to the combined requirement. The integrated thruput dropped a bit, but remains well above 3 x this requirement, so the rating remains "**Excellent**".



As seen on the integrated graph, the user flow is often lower than the requirement, except for frequent bursts.

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**

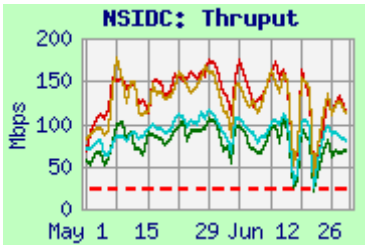
Web Pages: http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

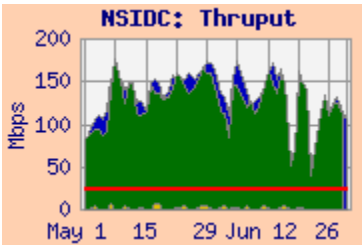
The NSIDC DAAC was disconnected from NISN PIP in December '09 – all flows now go via the UCB campus, usually via FRGP to Internet2 or NLR. Thus the DAAC competes with the students for network capacity, and there is often significant diurnal variation. DAAC performance improved and stabilized at the end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

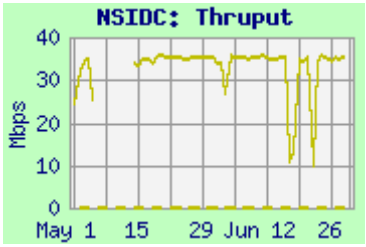
It is planned to upgrade the UCB connection to FRGP from 1 gbps to 10 gbps in 2011.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODIS-PDR → NSIDC DAAC	179.7	122.8	76.1	1.4	122.8
GES-DISC → NSIDC DAAC	173.2	130.8	68.6		
GSFC-EDOS → NSIDC DAAC	111.3	72.3	24.2		
GSFC-ISIPS → NSIDC (iperf)	120.1	88.6	54.6		
JPL PODAAC → NSIDC DAAC	37.0	35.0	16.6		







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**

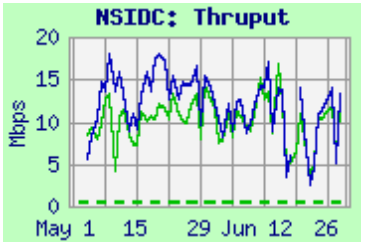
Comments: GSFC → NSIDC S4PA: This rating is based on testing from the MODIS-PDR server to the NSIDC DAAC, since this is the primary production flow. The requirement was reduced in May '09 from 34.5 mbps (and was 64 mbps in April '08). Thruput from all GSFC sources exhibited a strong diurnal variation in April – but was much reduced in May, with the students away.

The integrated thruput from MODIS remains above the requirement, by more than 3x, so the rating remains "**Excellent**".. The user flow was similar to last month, and remains less than 10% of the reduced requirement. Testing from other GSFC sources, including GES DISC, EDOS, and ISIPS, is similar to MODIS.

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**".

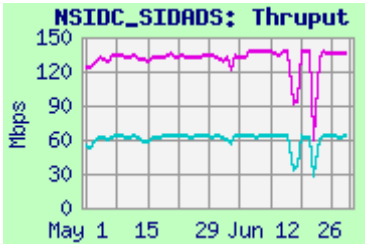
5) Boulder CO sites (Continued):

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



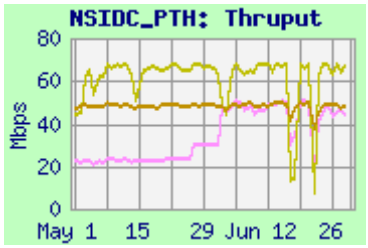
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GHRC → NSIDC DAAC (nuttcp)	20.5	10.4	3.5
GHRC → NSIDC DAAC (ftp pull)	36.1	11.9	3.0

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 thruput is more than 3x the 0.5 mbps requirement, so the rating remains "**Excellent**". Performance improved at the end of April, with the students' departure.



Test Results: NSIDC SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	141.2	136.1	116.9
GSFC-NISN → NSIDC-SIDADS	63.4	62.9	51.5
ESDIS-PTH → NSIDC-PTH	52.3	46.3	35.6
MODIS-PDR → NSIDC-PTH	53.5	48.7	43.5
JPL PTH → NSIDC-PTH	68.1	65.3	27.8



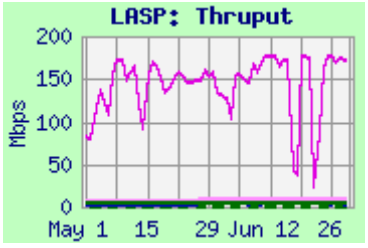
GSFC → NSIDC-SIDADS: Thruput via Internet2 to SIDADS from ENPL and GSFC-NISN showed similar reduced diurnal variation. Thruput from GSFC-NISN, ESDIS-PTH, and JPL dropped at the end of January due to increased RTT from the NLR to I2 switch.

NSIDC-PTH: Thruput from ESDIS-PTH improved in early June due to turning TSO off on ESDIS-PTH (see 3.1 QSCAT). Testing to NSIDC-PTH ahad lso previously displayed similar diurnal variation.

5.2) LASP:

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

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

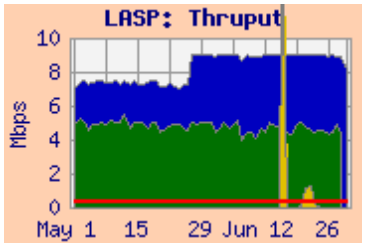


Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC EDOS → LASP blue	7.36	4.56	2.22
ESDIS-PTH → LASP blue (iperf)	9.10	9.02	8.27
ESDIS-PTH → LASP blue (scp)	3.79	3.61	3.06
GSFC ENPL → LASP green	177.3	168.2	74.6

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: previously was 100 mbps from CU-ITS via NSIDC; this was changed to a 10 mbps connection to the NISN POP in Denver.

Thruput was consistent with the new circuit limitation. The median thruput from EDOS remained well over 3x the requirement, so the rating remains "**Excellent**". The average user flow this month was above both typical and the requirement at 0.6 kbps.

ESDIS-PTH also tests to the test node on LASP's blue network. Thruput improved around 1 June due to disabling of TSO on ESDIS-PTH (see 3.1 QSCAT). SCP performance from ESDIS-PTH to LASP was also very steady.

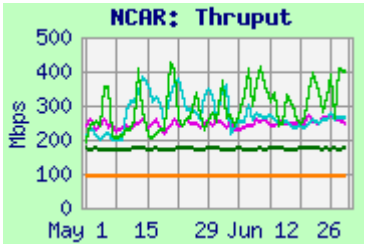
Performance from GSFC-ENPL to a node on LASP's green network via Internet2 / UCB was much higher, and was no longer subject to congestion from students -- like NSIDC systems.

5) Boulder CO sites (Continued):

5.3) NCAR:

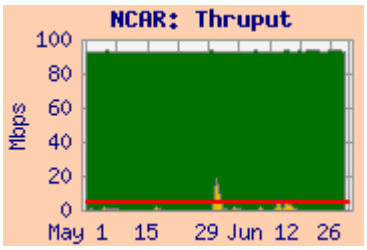
Ratings: LaRC → NCAR: Continued **Excellent**

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



Test Results:

Source	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
LaRC ASDC	440.6	324.6	190.4	0.1
LaRC PTH	180.8	173.3	137.8	
GSFC-ENPL-GE	321.9	247.9	179.9	n/a
GSFC-ENPL-FE	93.6	93.5	93.4	
GSFC-NISN	338.4	256.8	138.6	



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 ASDC was somewhat noisy (2.3:1 best : worst ratio), but the median (and daily worst, for that matter) remained well above 3 x the reduced requirement, so the rating remains "**Excellent**".

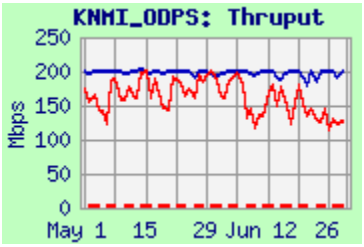
From GSFC-NISN, the route is via NISN to the MAX (similar route and performance as from LaRC). From GSFC-ENPL-GE, with a Gig-E connection to MAX, the median thruput was about the same. Performance from all sources is somewhat noisy but mostly stable. The average user flow from GSFC this month was 0.9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

---

6) KNMI:

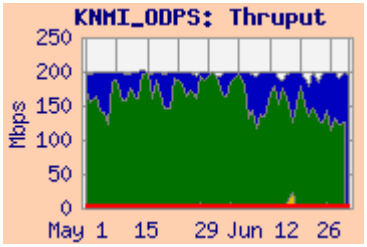
Rating: Continued **Excellent**

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



Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Reqmt
OMISIPS → KNMI-ODPS	194.5	144.8	92.9	0.03
GSFC-ENPL → KNMI-ODPS	204.1	198.9	165.2	



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 was much more than the tiny requirement, so the rating remains "**Excellent**". Thruput was quite steady from GSFC-ENPL (outside the ESDIS firewall).

The user flow averaged 2.5 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).

7) Remote Sensing Systems (RSS):

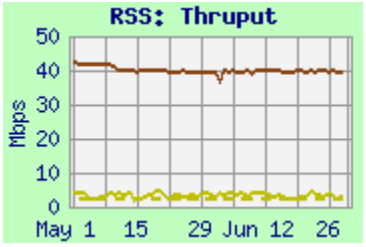
Ratings: **JPL → RSS:** Continued **Excellent**
RSS → GHRC: Continued **Excellent**

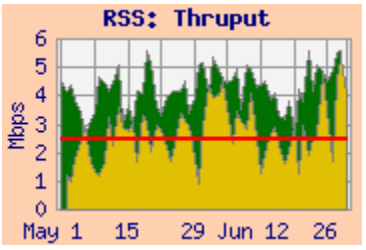
Web Page http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml

Test Results:

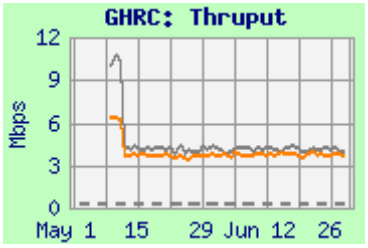
Source → Dest	Medians of daily tests (mbps)					
	Best	**Median**	**Worst**	**User Flow**	**Integ.**	**Req**
JPL → RSS (NISN)	5.61	3.25	1.14	3.06	4.56	0.49
JPL → RSS (Comcast)	40.8	39.7	35.8			
RSS (Comcast) → GHRC (UAH)	5.24	4.14	2.71			0.34
RSS (Comcast) → GHRC (NISN)	4.48	3.73	2.91			

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 now 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**

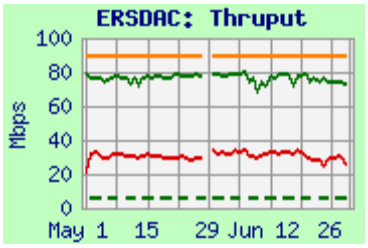
Web Page: http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml

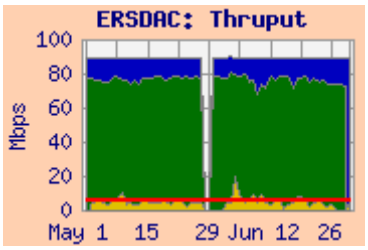
US ←→ ERSDAC Test Results

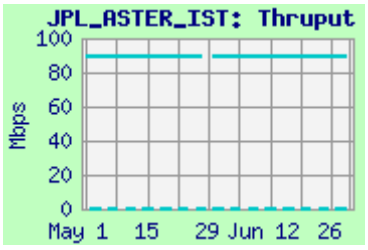
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-EDOS → ERSDAC	82.1	76.4	21.5	4.6	76.5
GES DISC → ERSDAC	37.1	31.2	22.7		
GSFC ENPL (FE) → ERSDAC	89.6	89.5	89.2		
ERSDAC → EROS	73.7	60.8	21.1	13.3	
ERSDAC → JPL-ASTER IST	90.0	89.9	89.7		

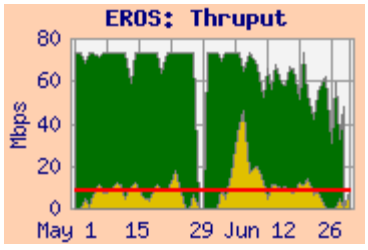
Requirements:

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 thruput 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 thruput that GES DISC – thruput similar to ENPL-FE.

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

ERSDAC → EROS: The thruput 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 thruput 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 average user flow this month averaged 2.8 mbps from GSFC to JAXA (with peaks above 10 mbps), and 127 kbps from JAXA to GSFC (with regular peaks to 3 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.