

EOS Production Sites Network Performance Report

This is a monthly summary of EOS network performance testing between production sites for August 2008 -- comparing the measured performance against the requirements.

Highlights:

- **Mostly stable flows with continued congestion at GSFC**
 - GPA 3.39 (Last month: 3.42)
- **Only 2 flows below "Adequate"**
 - **GSFC MODAPS-PDR to EROS ("Low")**
 - Due to EBnet to Doors congestion at GSFC
 - JPL to RSS: ("**Almost Adequate**")
 - Probably due to high user flow
- **Bottlenecks:**
 - GSFC: EBnet to Doors Gig-E
- Significant improvements are noted in Green, Network problems in Red, System problems in Gold, and comments in Blue.

Ratings Changes: (See site discussion below for details)

Upgrade: ↑

GHRC → NSIDC: Good → **Excellent**

Downgrades: ↓:

JPL → RSS: Adequate → **Almost Adequate**

EDOS → ERSDAC: Excellent → **Good**

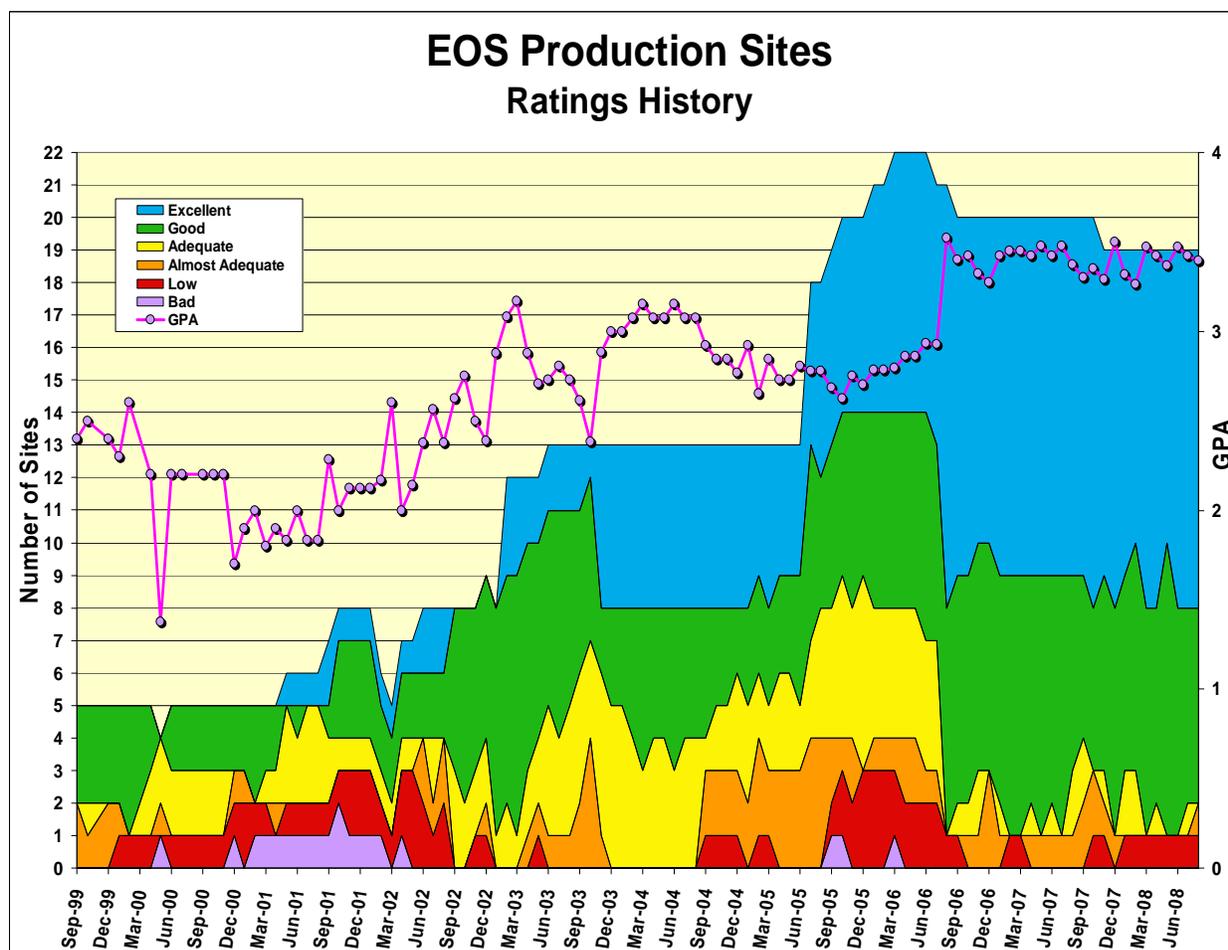
Testing Down X:

ASF → LASP, GSFC → ASF (ASF IOnet node is not available)

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



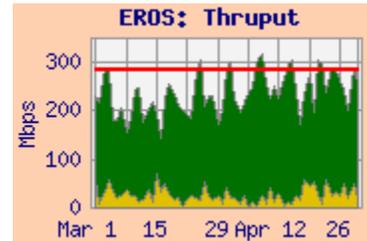
The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

Requirements Basis:

- April '08 Revisions
 - Reduced GEOS Flows
 - Increased MODIS reprocessing
- December '03 requirements from BAH.
 - Updated to handbook 1.4.1 (3/22/06)
- Additional Updates Incorporated:
 - New AIRS reprocessing flows (8/06)
 - GEOS requirements – Flows began in Nov '06
 - All LaRC-GSFC “Backhaul” Requirements removed
 - Extension of TRMM, QuikScat missions

Integrated Charts:

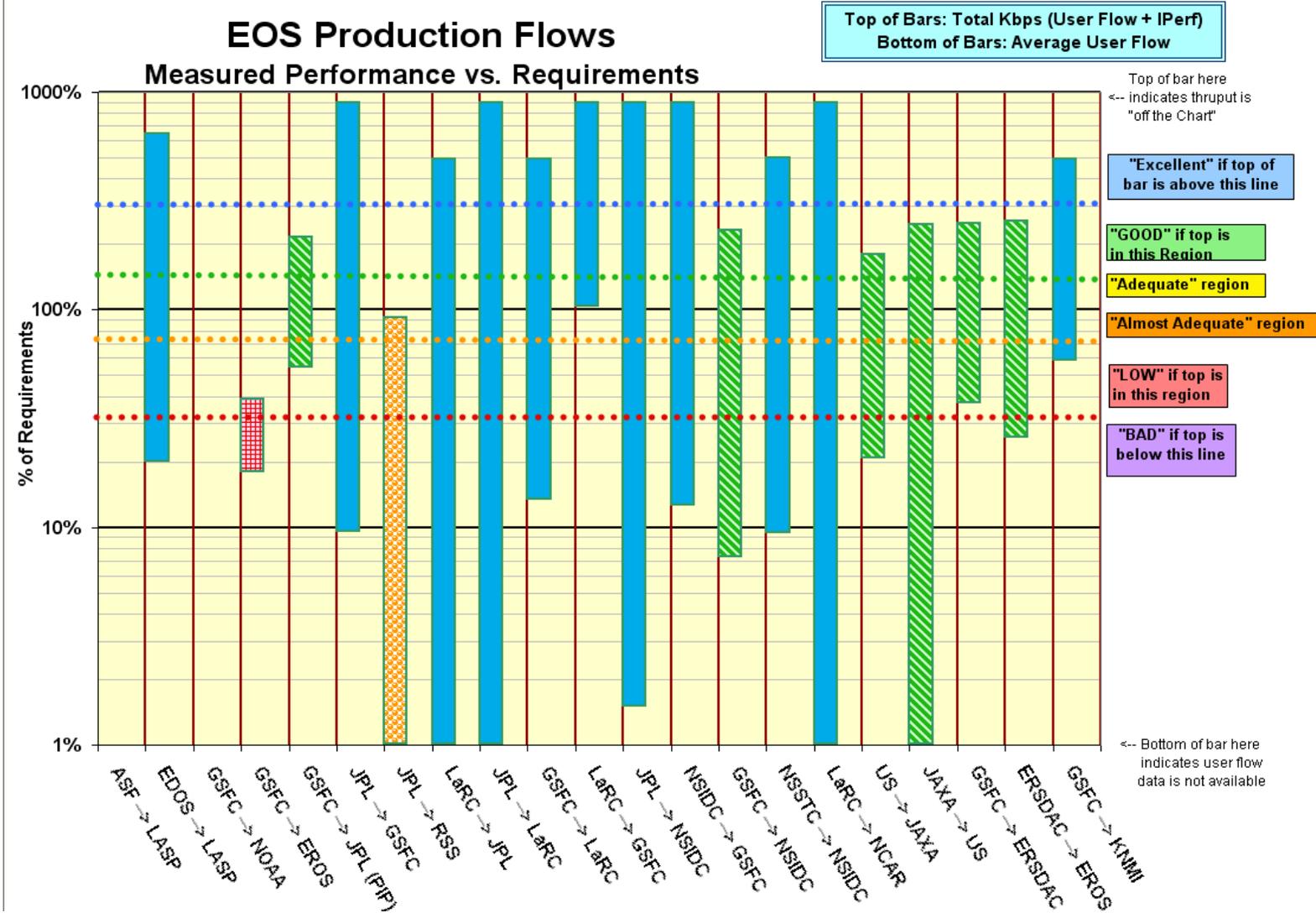
Integrated charts are included with site details, where available. These charts are “Area” charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (e.g., EROS, 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 thruptut 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. The 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.



Network Requirements vs. Measured Performance

August 2008		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current	Future	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements		Rating re
		Aug-08	Oct-08					Aug-08	Last Month	Oct-08
WSC → ASF	ALOS	n/a	n/a	WSC → ASF-AADN		74.4		n/a	n/a	n/a
ASF → LASP	QuikScat	0.02	0.02	ASF → LASP [via IOnet]				n/a	n/a	n/a
EDOS → LASP	ICESat, QuikScat	0.4	0.4	EDOS → LASP [via IOnet]	0.08	2.5		Excellent	E	Excellent
GSFC → EROS	MODIS, LandSat	345.9	345.9	MODAPS-PDR → EROS LPDAAC	61.9	89.2	134.5	LOW	L	LOW
GSFC → JPL (PIP)	AIRS, MLS, ISTs	43.6	38.5	GSFC-PTH → JPL-AIRS	23.6	93.5	93.7	GOOD	G	GOOD
JPL → GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	0.7	65.8		Excellent	E	Excellent
JPL → RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		2.3		AA	A	AA
LaRC → JPL	TES, MISR	43.2	43.2	LARC-DAAC → JPL-TES		214.3		Excellent	E	Excellent
JPL → LaRC	TES	4.4	4.4	JPL-PTH → LARC-PTH		63.9		Excellent	E	Excellent
GSFC → LaRC	CERES, MISR, MOPITT	60.5	48.7	GDAAC → LDAAC	8.1	297.1	297.1	Excellent	E	Excellent
LaRC → GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.2	429.7	429.7	Excellent	E	Excellent
JPL → NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.02	81.6		Excellent	E	Excellent
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.5	0.5	NSIDC DAAC → GDAAC	0.06	115.4	115.4	Excellent	E	Excellent
GSFC → NSIDC	MODIS, ICESAT, QuikScat	34.5	34.5	MODAPS-PDR → NSIDC-DAAC	2.5	79.7	80.0	GOOD	G	GOOD
NSSTC → NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.7	37.5	37.5	Excellent	G	Excellent
LaRC → NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		117.4		Excellent	E	Excellent
US → JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.41	3.41	3.56	GOOD	G	GOOD
JAXA → US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		3.16		GOOD	G	GOOD
GSFC → ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	4.6	29.1	31.0	GOOD	E	GOOD
ERSDAC → EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	6.9	66.6	69.0	GOOD	G	GOOD
GSFC → KNMI	OMI	3.3	3.3	GSFC-OMISIPS → ODPS	1.9	15.8	16.2	Excellent	E	Excellent
							Ratings Summary			Oct-08
							Aug-08 Req		Req	
							Score	Prev	Score	
*Criteria:	Excellent	Total Kbps > Requirement * 3				Excellent	11	11	11	
	GOOD	1.3 * Requirement <= Total Kbps < Requirement * 3				GOOD	6	6	6	
	Adequate	Requirement < Total Kbps < Requirement * 1.3				Adequate	0	1	0	
	Almost Adequate	Requirement / 1.3 < Total Kbps < Requirement				Almost Adequate	1	0	1	
	LOW	Requirement / 3 < Total Kbps < Requirement / 1.3				LOW	1	1	1	
	BAD	Total Kbps < Requirement / 3				BAD	0	0	0	
							Total Sites	19	19	19
Notes:	Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS						GPA	3.39	3.42	3.39

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 **Good**

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	167.6	89.2	29.5	61.9	134.5
GSFC-DAAC → EROS LPDAAC	215.9	91.7	34.9		
ERSDAC → EROS LPDAAC	79.3	66.6	26.8	6.9	69.0
GSFC-EBnet-PTH → EROS PTH	289.8	80.2	28.1		
GSFC-ENPL → EROS PTH	480.3	438.8	316.8		
GSFC-NISN → EROS PTH	486.6	453.0	335.3		
NSIDC → EROS	102.8	98.4	75.5		
LaRC → EROS	93.0	93.0	93.0		

Requirements:

Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08-11	346	Low
ERSDAC → EROS	FY '06 - '08	26.8	Good

Comments:

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

The requirement was increased in May '08 (was 285 mbps previously), to allow additional MODIS reprocessing, which was partially mitigated by the compression used in MODIS collection 5. The user flow this month was a bit higher than the 58 mbps last month, and remains far below the nominal requirement.

The performance is predominantly limited by congestion on the EBnet to Doors Gig-E circuit at GSFC, as shown by the large best:worst ratio seen from the GDAAC, MODAPS, and GSFC-PTH hosts. The performance is about the same as recent months, and remains more than 30% below the requirement so the rating remains "Low".

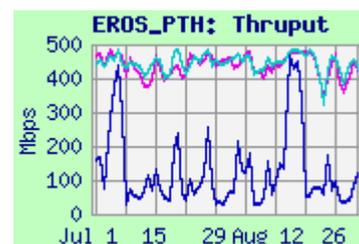
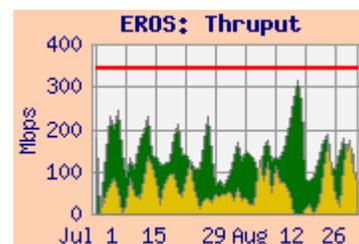
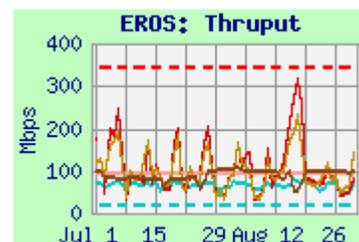
The GSFC-NISN host uses the same NISN route as above, but is connected outside the congested EBnet to Doors Gig-E circuit, so its performance is much higher (peak performance is more than twice that of MODAPS) and steadier (the daily worst is better than MODAPS by a factor of almost 10:1) than from MODAPS or the GES DAAC. It would be rated "Good".

The ENPL host has a direct connection to the MAX, also bypassing the congested EBnet to Doors Gig-E circuit. It uses the previous Internet2 route. Performance is similar to the GSFC-NISN source

ERSDAC → EROS: Performance was relatively steady this month. See section 7 (ERSDAC) for the graph and further discussion of this performance.

NSIDC → EROS: Performance was very steady this month.

LaRC → EROS: The throughput from LaRC-PTH to EROS-PTH was again very stable this month via NISN to the Chicago CIEF. Throughput is limited to 100 mbps by the Fast-E connection at LaRC-PTH.



2) to GSFC

Ratings: NSIDC → GDAAC: Continued **Excellent**
 LDAAC → GDAAC: Continued **Excellent**
 JPL → GDAAC: Continued **Excellent**

Web Pages:

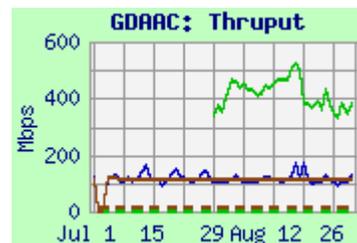
- <http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>
- http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
EROS LPDAAC → GSFC DAAC	141.6	113.0	86.6		
EROS PTH → GSFC PTH	452.1	417.5	357.8		
JPL-PTH → GSFC PTH	66.4	65.8	64.3	0.7	
LDAAC → GDAAC	489.5	429.7	181.5	0.2	429.7
LARC-ANGe → GSFC-PTH	370.3	334.6	241.1		
NSIDC DAAC → GSFC-DAAC	116.4	115.4	112.4	0.1	

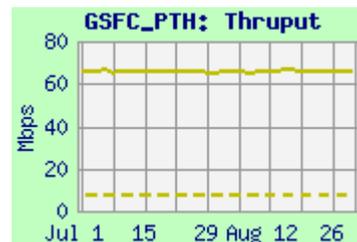
Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '08	13.3	Excellent
LDAAC → GDAAC	FY '07 – '08	0.2	Excellent
JPL → GSFC combined	CY '06-09	7.4	Excellent



EROS → GSFC: The thrupt for tests from EROS to GSFC (both DAAC to DAAC and PTH to PTH) were mostly stable this month, but note that the DAAC to DAAC flow cannot use most of the WAN capability (compared to the EROS-PTH to GSFC-PTH results).

JPL → GSFC: Thrupt was stable at 65 mbps for the last 4 months (but was previously bimodal at either 65 or 90 mbps, since 2007 (thrupt from JPL-PTH to LaRC-PTH is similar). With the modest requirement, the rating remains “Excellent”.



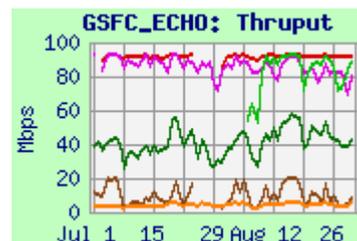
LaRC → GSFC: Performance from LDAAC → GDAAC improved with retuning in November '07, and remained much more than 3 x the modest requirement, so the rating continues as “Excellent”. The user flow was about the same as recent months.

NSIDC → GSFC: Performance from NSIDC to GSFC was very steady this month; with the low requirement the rating remains “Excellent”. The user flow on this path averaged only 100 kbps.

2.2 GSFC-ECHO

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	69.3	52.1	24.7
EROS LPDAAC ftp	11.8	8.7	4.2
GES DAAC	93.2	92.1	85.6
GES DAAC ftp	92.8	84.6	56.3
NSIDC DAAC	19.7	9.1	2.9
NSIDC DAAC ftp	5.6	4.6	2.4
LaRC ASDC DAAC	92.6	86.9	26.0
LaRC ASDC DAAC ftp	57.3	43.2	18.0



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

3) JPL:

3.1) GSFC → JPL:

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

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-PTH → JPL-AIRS	270.7	93.5	29.6	23.6	93.7
GSFC-DAAC → JPL-AIRS	119.3	78.2	37.4		
GSFC-PTH → JPL-PODAAC	187.4	52.7	16.7		
GSFC-PTH → JPL-QSCAT	87.4	37.5	13.2		
GSFC-PTH → JPL-MLS	111.9	29.5	10.0		
GSFC-NISN → JPL-MLS	111.4	90.9	78.5		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	Jan '08-Sept '08	43.6	Good
GSFC → JPL AIRS	Jan '08-May '09	35.2	Good
GSFC → JPL PODAAC	Jan '08-May '11	1.5	Excellent
GSFC → JPL QSCAT	Jan '08-May '11	1.0	Excellent
GSFC → JPL MLS	Jan '08-Sept '08	5.9	Excellent

Comments: The GSFC to JPL combined requirement was reduced in Jan '08, due mostly to revision of the GEOS 5 flows (the requirement was 113 mbps previously). The rating upgrade in April was substantially due to this requirements decrease – the measured performance was mostly consistent.

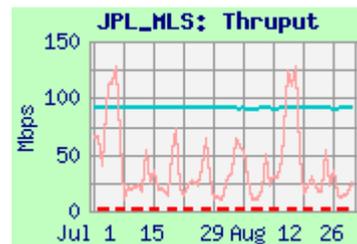
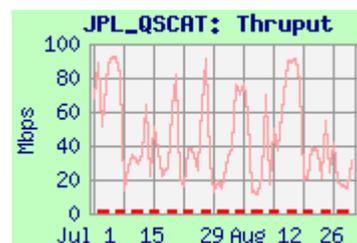
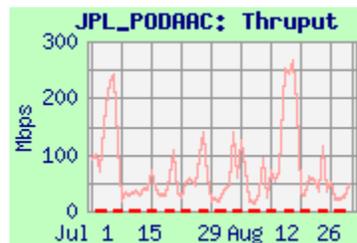
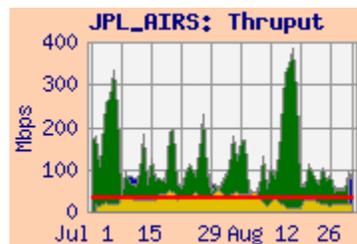
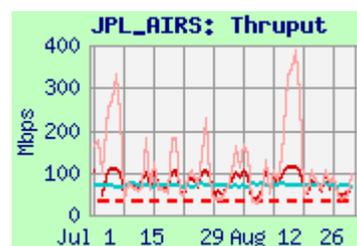
The EBnet to Doors congestion at GSFC is the bottleneck for most of these flows, and creates large variations in performance (After the NISN to JPL campus connection upgrade to Gig E in September '07). The user flow from GSFC/EOS was a bit lower than last month's 31 mbps, and was consistent with the requirement without contingency.

AIRS, Overall: The median thrupt from GSFC-PTH remains a bit less than 3x the AIRS requirement; so the AIRS rating remains "Good". The **JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the overall rating remains "Good"

PODAAC: Thrupt peaks are over 200 mbps, while median thrupt is much lower, due to congestion at GSFC. The GSFC-PODAAC requirement (for MODIS data) is only 1.5 mbps, rating "Excellent"

QSCAT: The median thrupt from GSFC-PTH peaks close to 100 mbps – limited by a Fast-E connection at QSCAT, and congestion at GSFC. The QSCAT requirement is only 1.3 mbps, rating "Excellent".

MLS: The GSFC-MLS requirement is for MLS and GEOS flow, and was reduced in April '08. Thrupt from GSFC-PTH was noisy but stable this month; the rating remains "Excellent". Testing from GSFC-NISN avoids the EBnet congestion seen from GSFC-PTH –although the peaks were similar, the median and daily worst were much higher than from GSFC-PTH.



3.2) LaRC ↔ JPL

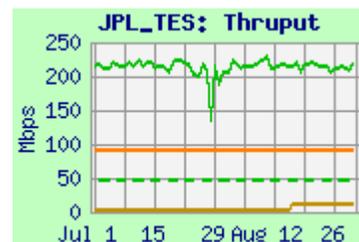
Ratings: LaRC → JPL: Continued **Excellent**
 JPL → LaRC: Continued **Excellent**

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

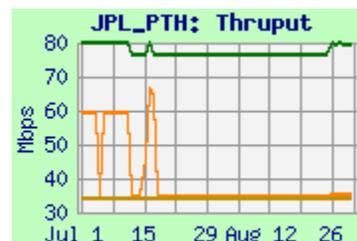
Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC DAAC → JPL-TES	249.9	214.3	11.3
LaRC PTH → JPL-TES	91.3	91.3	91.2
LaRC PTH → JPL-TES sftp	11.6	11.4	6.9
LaRC PTH → JPL-PTH sftp	34.0	34.0	33.9
LaRC DAAC → JPL-MISR	88.5	72.7	3.7
LaRC PTH → JPL-MISR	89.9	82.6	41.2
JPL-PTH → LaRC PTH	64.1	63.9	63.7



Requirements:

Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '08	29.8	Excellent
LaRC DAAC → JPL-MISR	FY '07 – '08	18.5	Excellent
LaRC → JPL-Combined	FY '07 – '08	45.8	Excellent
JPL PTH → LaRC PTH	FY '07 – '08	4.4	Excellent



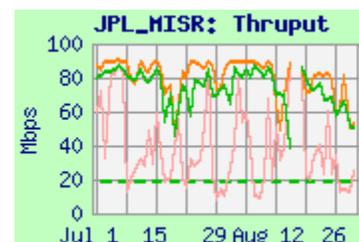
Comments: Note: The old LaRC ASDC DAAC test node was retired in late June – testing from its replacement began July. Performance levels are a bit lower from this node, although still well above the requirements.

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): Performance for most tests improved in Sept. '07 with the NISN to JPL Ethernet upgrade, and the ratings improved at that time. Median performance from LDAAC to JPL-TES was lower from the new system than the old one (median was 325 mbps), but was still well over 3 x the TES and combined requirements, so the TES and Overall ratings remain “Excellent”.

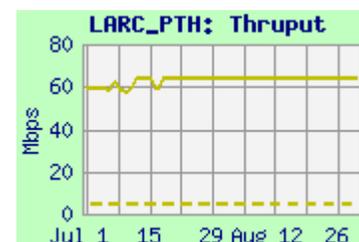
The TES system was upgraded in February '08; the sftp window size and sftp performance increased with that upgrade – but declined back to 3.5 mbps in mid-March again due to TCP window limitations. This was corrected in August, with a corresponding throughput increase. Sftp results are even better from LaRC-PTH to JPL-PTH which uses an even larger window size.

LARC → JPL (MISR): Median thruput was again a bit noisy; the rating remains “Excellent”.



The very low daily worst from LaRC DAAC to TES and MISR (compared to the respective daily medians) is attributed to congestion on the LaRC campus LAN. Note that the thruput from LaRC-PTH (which is connected directly to NISN), to the same destinations, is much steadier.

JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. Thruput was stable this month (not bimodal like other JPL-PTH flows previously). The requirement was reduced in April from 52.6 mbps previously, so the rating improved to “Excellent” at that time.



4) Boulder CO:

4.1) GSFC → NSIDC:

 Ratings: GSFC → NSIDC: Continued **Good**

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODIS-PDR → NSIDC-DAAC	88.5	79.7	27.8	2.5	80.0
GSFC-DAAC → NSIDC-DAAC	104.7	48.1	17.2		
GSFC-ENPL → NSIDC_u	114.2	113.0	98.5		
MODIS-PDR → NSIDC_u	91.0	64.1	25.4		
GSFC-ISIPS → NSIDC (iperf)	n/a	n/a	n/a		
GSFC-ISIPS → NSIDC (ftp)	18.9	8.0	2.2		

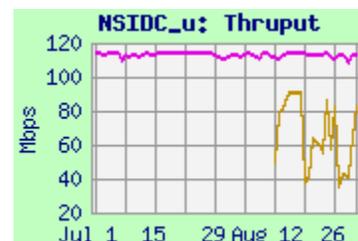
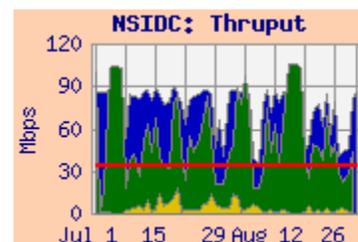
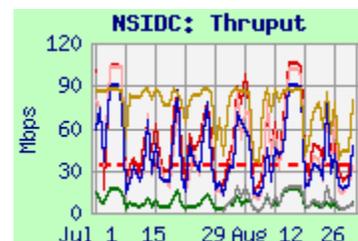
Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '08	34.5	Good

Comments: GSFC → NSIDC: This rating is based on testing from the MODAPS PDR server to the NSIDC DAAC via NISN PIP, since this is the primary production flow. The thrupt values were mostly stable this month, but were noisy, due to congestion at GSFC. The requirement was reduced in April '08 (was 64 mbps previously) due to the use of compression in MODIS collection 5. The Integrated thrupt is above this lower requirement, by more than 30%, so the rating remains "Good". Note that the integrated graph shows that the user flow remains **MUCH** lower, even than the reduced requirement.

GSFC → NSIDC u via Internet2: Results via Internet2 are now also shown above, in the interest of possibly switching the production flows from PIP to Internet2. Thrupt on this path from ENPL was steady and well above the requirement – it would rate "Excellent". So from a performance viewpoint, it appears that this is a viable option. Testing via Internet2 from MODAPS was initiated in August; results are similar to those from MODAPS via NISN.

GSFC-ISIPS ← → NSIDC: FTP testing has been restarted in August (iperf testing was restored in September). Results are consistent with previous tests



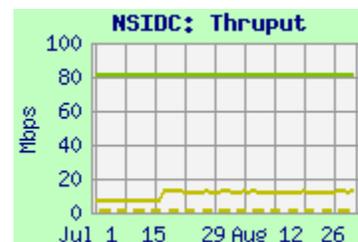
4.2) JPL → NSIDC:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
JPL PTH → NSIDC-PTH	81.6	81.6	40.4	1.34
JPL PODAAC → NSIDC	13.1	12.2	6.1	

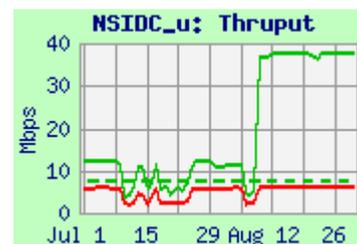
Comments: The test from JPL-PTH to NSIDC-PTH more fully assesses the true network capability – the thrupt is much higher than from PODAAC. Thrupt from JPL-PTH was stable; it had increased in June back to its higher bimodal value. Thrupt from PODAAC to NSIDC-SIDADS was much lower but increased in mid July. User flow on this path was only about 17 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".



4.3) GHRC → NSIDC:Ratings: GHRC → NSIDC: ↑ Good → **Excellent**Web Pages: http://ensight.eos.nasa.gov/Missions/aqua/NSIDC_u.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Req.
GHRC → NSIDC DAAC (iperf)	37.8	37.5	23.5	7.5
GHRC → NSIDC DAAC (ftp)	6.2	6.2	5.4	

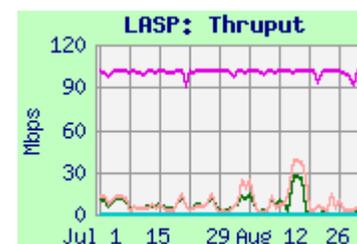
Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via NISN PIP. The iperf throughput improved this month, when NISN increased the SCR (yes, it's still ATM) on the SIP interface! The ftp performance was limited by the TCP window size, so did not benefit. The median is now more than 3x the requirement, so the rating improves to "Excellent". The user flow averaged only 700 kbps this month, under 10% of the requirement.

**4.4) 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	Req
GSFC EDOS → LASP	23.1	2.5	0.0	0.4
GSFC PTH → LASP (iperf)	33.5	7.1	1.6	
GSFC ENPL → LASP	101.8	101.3	81.7	
GSFC PTH → LASP (sftp)	0.46	0.45	0.43	

Comments: ASF → LASP: Testing from ASF remains down since October '07, when the ASF IOnet test node stopped working, due to reconfiguration at ASF.

GSFC → LASP: Iperf throughput is very noisy (note the 20:1 best:worst ratio from GSFC-PTH). This is attributed to EBnet congestion at GSFC, but since the median throughput is well above the requirement, the rating continues "Excellent". Sftp throughput is MUCH lower than iperf, due to TCP window size limitations. Performance is much higher and steadier from GSFC-ENPL via Internet2, which avoids the EBnet congestion at GSFC. The user flow on IOnet via 82 kbps this month, similar to recent months.

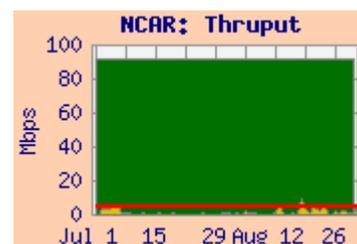
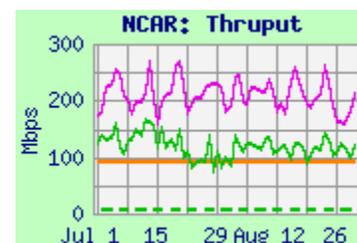
**4.5) NCAR:**Ratings: LaRC → NCAR: Continued **Excellent**
GSFC → NCAR: Continued **Excellent**Web Pages: <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>**Test Results:**

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
LaRC → NCAR	161.8	117.4	13.1	5.4
GSFC-ENPL → NCAR	290.8	211.5	105.8	5.1

Comments: NCAR (Boulder, CO) is a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS QA (Aura, from GSFC) requirements. Throughput from LaRC dropped from a median of 225 mbps with the change in hosts at LaRC in July. It remains well above 3 x the requirement, so the rating remains "Excellent".

From GSFC-ENPL, with a Gig-E connection to MAX, the median throughput is noisy, but also well over 3 x the requirement, so that rating also remains "Excellent".

The Integrated graph shows that the peak user flow from GSFC is fairly consistent with the stated requirement. The average user flow this month was about 0.7 mbps (typical of recent months).



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

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GDAAC → LDAAC	420.1	297.1	172.9	8.1	297.1
GSFC-EDOS → LDAAC	n/a	n/a	n/a		
GSFC-PTH → LaRC-ANGe	373.7	264.6	128.6		
GSFC-NISN → LaTIS	405.4	361.9	291.4		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '08	60.5	Excellent

Comments: Note: The old LaRC ASDC DAAC test node was retired in late June – testing to its replacement began in July.

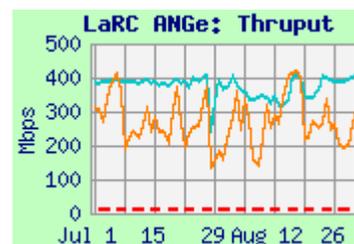
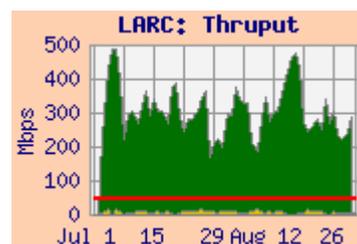
GSFC → LaRC: The requirement was reduced effective January '08 due to decreased GEOS flows (was 86.9 mbps previously). The rating is based on the GDAAC to LaRC ASDC DAAC thrupt, compared to this combined requirement. The integrated thrupt increased last month with the new host at LARC – it remains more than 3 x this decreased requirement, so the rating remains “Excellent”

Testing from EDOS is waiting on firewall rules at GSFC and LaRC to resume with the new host.

The large difference between the daily best, median, and average values is attributed to congestion at GSFC.

As seen on the Integrated graph, the 8.1 mbps average user flow was lower than last month's 9.4 mbps, and well below the requirement. **Significant GEOS flows are apparently still NOT occurring at this time.**

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



6) US ↔ JAXA:

Ratings: US → JAXA: Continued **Good**
 JAXA → US: Continued **Good**

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/Organizations/production/JPL_QSCAT.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-PTH → JAXA-DDS	4.15	3.41	2.43	0.41	3.56
GSFC-ENPL → JAXA-azusa	74.3	65.9	45.9		
GSFC-PTH → JAXA-azusa	39.2	20.2	5.9		
GSFC-EDOS → JAXA-azusa	34.4	18.4	4.9		
GSFC-PTH → JAXA (sftp)	0.83	0.80	0.62		
JAXA-DDS → JPL-QSCAT	3.19	3.16	2.51		
JAXA-DDS → GSFC-DAAC	1.09	1.09	1.08		
JAXA-azusa → GSFC-MAX	86.0	85.4	28.7		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Dec '08	1.99	Good
JAXA → US	Nov '03 – Dec '08	1.28	Good

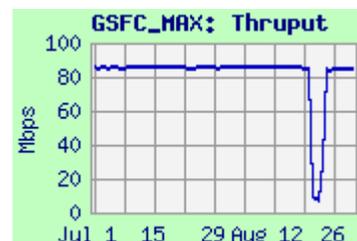
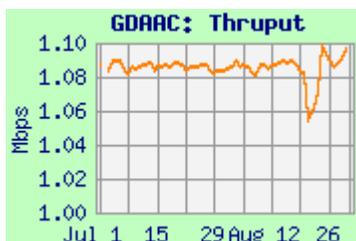
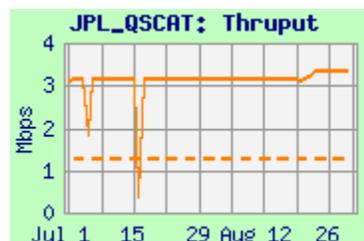
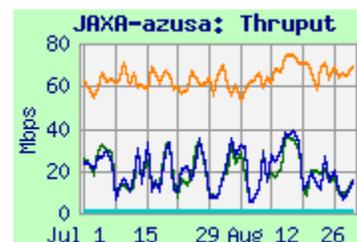
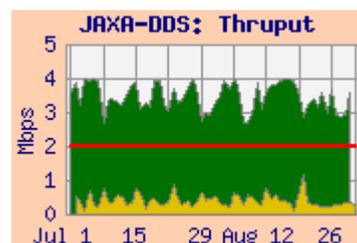
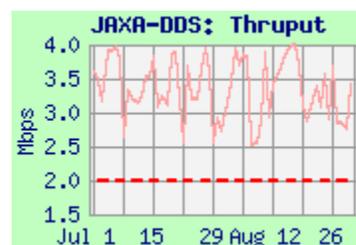
Comments:

US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Performance was mostly stable this month, **but subject to the EBnet to Doors congestion at GSFC**. Thruput was above the requirement, by more than 30%, but by less than 3x; so the rating remains "Good".

The integrated graph shows fairly consistent user flow, averaging about 20% of the requirement (or 30% of the requirement without the contingency).

Azusa: Performance from GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. **The lower value from GSFC-PTH and GSFC-EDOS is due to EBnet congestion**, not seen from GSFC-ENPL. But thruput using sftp between these same nodes is much lower, limited by ssh TCP window size. A patch is available, but is not installed

JAXA → US: Thruput from DDS to JPL and GSFC is limited by the DDS node's TCP window size (which has not been tuned to fully utilize the increased network capability) and its 10 mbps Ethernet. Average thruput from JAXA to JPL was above the requirement by more than 30%, so the rating remains "Good". Thruput was much higher from Azusa to GSFC, with a 100 mbps Ethernet connection, and larger TCP windows.



7) ERSDAC ↔ US:

Ratings: GSFC → ERSDAC: ↓ Excellent → **Good**
 ERSDAC → EROS: Excellent → **Good**

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	46.4	29.1	13.1	4.6	31.0
GDAAC → ERSDAC	26.0	19.3	8.7		
GSFC ENPL (FE) → ERSDAC	88.5	88.4	77.9		

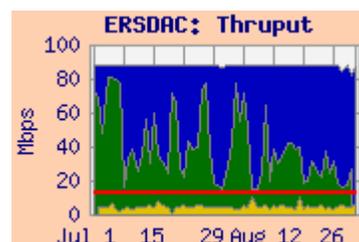
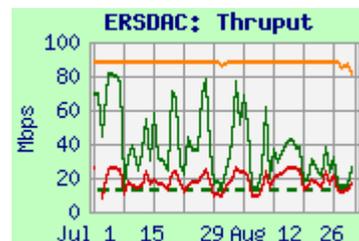
Requirements:

Source → Dest	FY	Mbps	Rating
GSFC → ERSDAC	'05 - '08	12.5	Good

Comments: Dataflow from GSFC to ERSDAC has been via APAN since February '05.

Testing from EDOS to ERSDAC is used as the basis for the rating -- the requirement includes the level 0 flows which used to be sent by tapes. Performance was noisy as usual, due to EBnet congestion; median thrupt this month decreased below 3 x the requirement, so the rating drops to "Good". The integrated chart shows that the user flow continues to be below the requirement, by almost a 3:1 factor.

The thrupt from GDAAC to ERSDAC appears to be limited by packet loss at the GigE to FastE switch at Tokyo-XP. The GigE GDAAC source does not see any bottlenecks until this switch (The Internet2 and APAN backbones are 10 Gbps), and thus exceed the capacity of the switch's FastE output circuit. But the FastE connected EDOS and GSFC-ENPL nodes are limited to 100 mbps by their own interfaces, so do not suffer performance degrading packet loss – and the performance is much higher.



ERSDAC → US Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ERSDAC → JPL-ASTER IST	89.9	89.7	8.6
ERSDAC → EROS	79.3	66.6	26.8

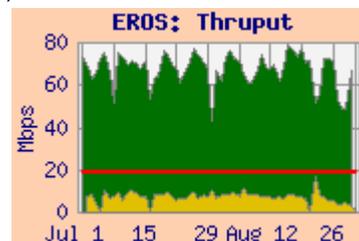
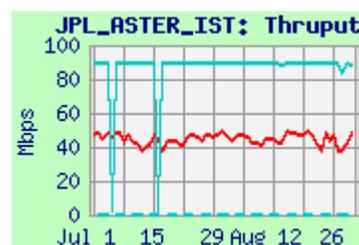
Requirements:

Source → Dest	Date	mbps	Rating
ERSDAC → EROS	FY '07- '08	26.8	Good

Comments:

ERSDAC → JPL-ASTER-IST: This performance this month was mostly very stable, and must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were noisy this month. Thrupt improved to this present values in April '05. The median thrupt is about 2 x the requirement, so the rating remains "Good". This user flow was steady at 6.9 mbps this month (was 7.5 mbps last month), about 25% of the requirement.



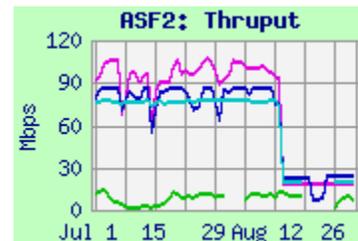
8) ASF

Ratings: IOnet: X Discontinued
WSC → ASF: n/a

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

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
WSC	77.5	74.4	33.7
GSFC	18.7	18.7	18.5
JAXA	24.0	23.9	22.9



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

WSC to ASF: Testing from White Sands (WSC) to ASF is for the ALOS mission. The route is from WSC via NISN SIP, peering with Internet2 at one of several possible peering points. Internet2 connects to the "Pacific Northwest Gigapop" (PNW) in Seattle. From there the University of Alaska – Fairbanks (UAF) has a dedicated OC-3 circuit to campus, then via campus LAN to the Alaska Satellite Facility (ASF). There is no firm requirement at this time, but it has been estimated at about 20 mbps.

Performance dropped significantly in mid August, when the ASF test node was moved to its intended final location, apparently due to LAN problems at ASF. If the 20 mbps requirement is correct, the rating would drop from "Excellent" to "Adequate"

9) Other SIPS Sites:

Web Pages <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Reqmt	Rating
	Best	Median	Worst		
JPL → RSS	4.9	2.3	0.9	2.5	↓ Adequate → A A
OMISIPS → KNMI-ODPS	18.3	15.8	10.3	3.3	Continued Excellent

Comments:

8.1 RSS: 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 thrupt from JPL remained noisy. Periods of low performance are believed to be attributable to correspondingly high user flow (User flow data remains unavailable on this circuit). The median iperf thrupt dropped below the requirement this month, but by less than 30%, so the rating drops to "Almost Adequate".



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

8.2 KNMI: 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 user flow averaged 1.9 mbps this month, about normal for recent months, and consistent with the requirement, as shown on the integrated graph.

