

EOS Production Sites Network Performance Report

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

Highlights:

- **Mostly stable flows with continued congestion at GSFC**
 - GPA 3.42 (Last month: 3.47)
- **Only 1 flow below "Adequate"**
 - **GSFC MODAPS-PDR to EROS ("Low")**
 - Due to EBnet to Doors congestion at GSFC
- **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)

Upgrades: ↑ None

Downgrade: ↓:

JPL → RSS: Good → **Adequate**

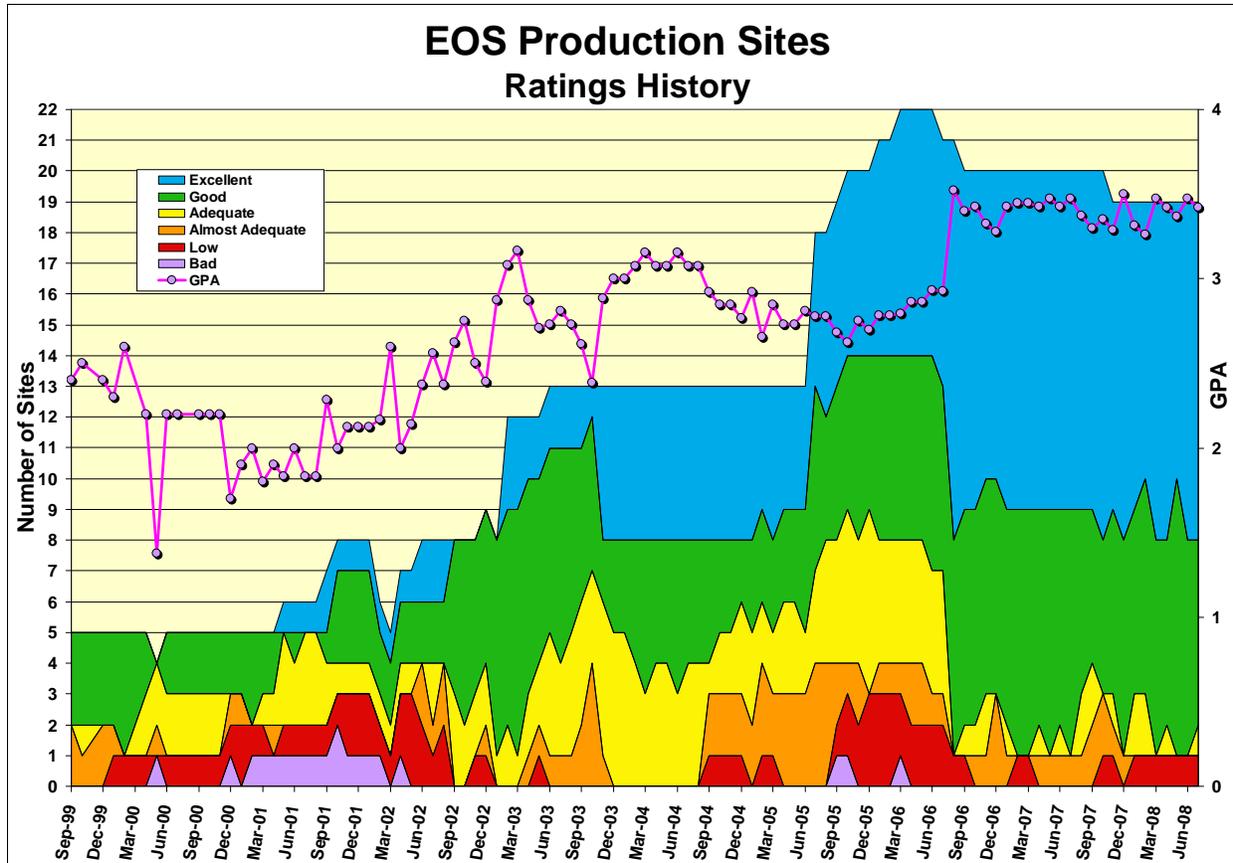
Testing Down X:

ASF → LASP, GSFC → ASF (ASF IOnet node is still 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



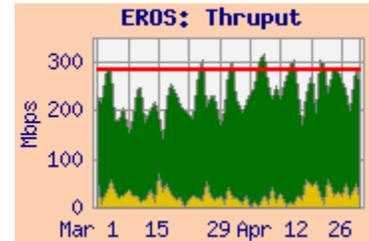
The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

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:

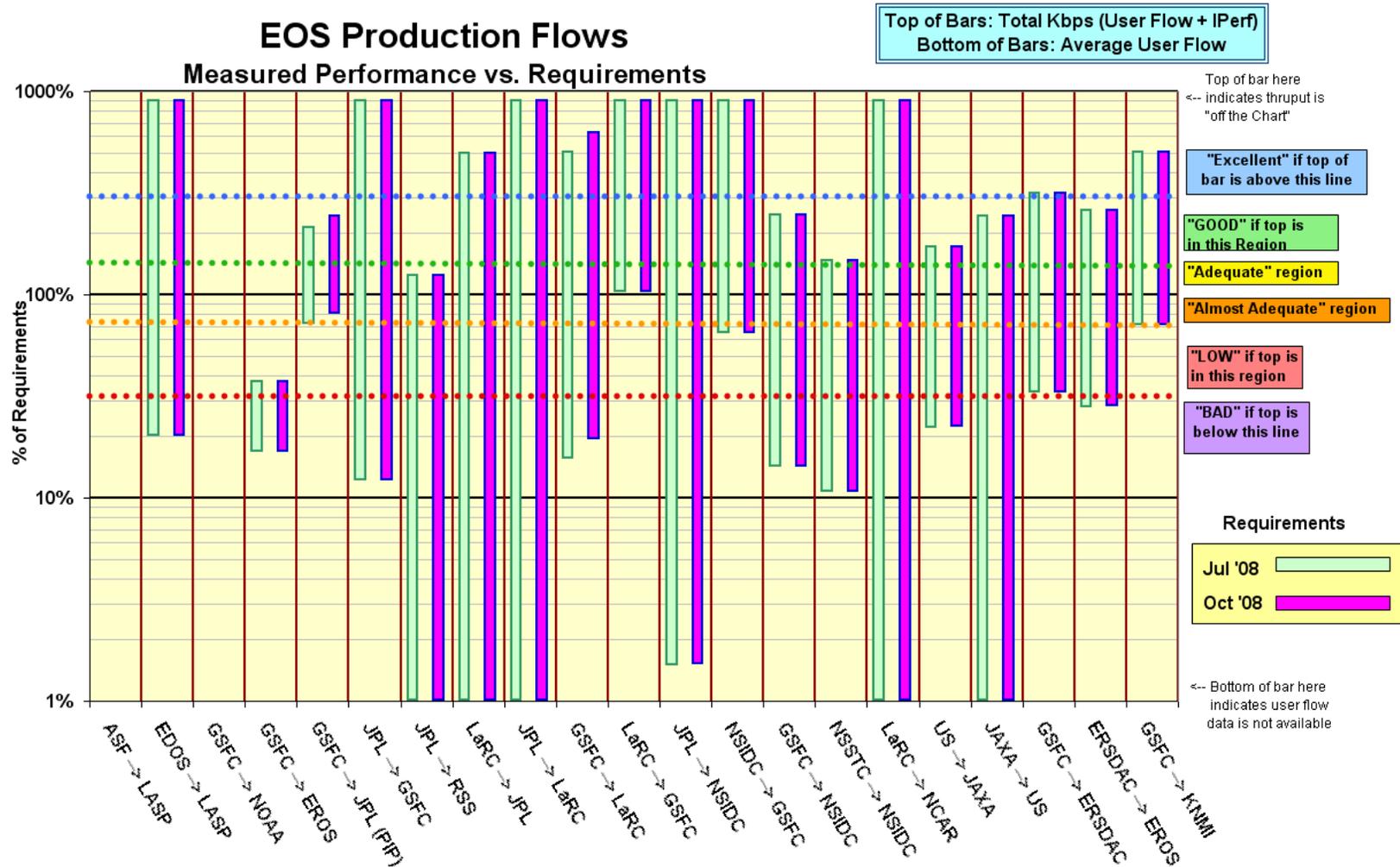
Integrated charts are included with site details, where available. These charts are “Area” charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the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

July 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	
		Jul-08	Oct-08					Jul-08	Last Month	Oct-08	
WSC → ASF	ALOS	n/a	n/a	WSC → ASF-AADN		76.8		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	6.0		Excellent	E	Excellent	
GSFC → EROS	MODIS, LandSat	345.9	345.9	MODAPS-PDR → EROS LPDAAC	57.7	98.7	129.0	LOW	L	LOW	
GSFC → JPL (PIP)	AIRS, MLS, ISTs	43.6	38.5	GSFC-PTH → JPL-AIRS	31.0	85.7	94.1	GOOD	G	GOOD	
JPL → GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	0.9	65.8		Excellent	E	Excellent	
JPL → RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		3.1		Adequate	G	Adequate	
LaRC → JPL	TES, MISR	43.2	43.2	LARC-DAAC → JPL-TES		214.5		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	9.4	301.1	304.5	Excellent	E	Excellent	
LaRC → GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.2	354.5	354.5	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	0.31	115.2	115.2	Excellent	E	Excellent	
GSFC → NSIDC	MODIS, ICESAT, QuikScat	34.5	34.5	MODAPS-PDR → NSIDC-DAAC	4.9	84.9	85.0	GOOD	G	GOOD	
NSSTC → NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.8	11.0	11.1	GOOD	G	GOOD	
LaRC → NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		124.1		Excellent	E	Excellent	
US → JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.44	3.3	3.4	GOOD	G	GOOD	
JAXA → US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		3.14		GOOD	G	GOOD	
GSFC → ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	4.1	37.2	39.2	Excellent	E	Excellent	
ERSDAC → EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	7.5	66.2	69.5	GOOD	G	GOOD	
GSFC → KNMI	OMI	3.3	3.3	GSFC-OMISIPS → ODPS	2.3	16.0	16.5	Excellent	E	Excellent	
							Ratings Summary			Oct-08	
								Jul-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	7	6			
	Adequate	Requirement < Total Kbps < Requirement * 1.3			Adequate	1	0	1			
	Almost Adequate	Requirement / 1.3 < Total Kbps < Requirement			Almost Adequate	0	0	0			
	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	3.42	3.47	3.42	

This graph shows two bars for each source-destination pair. Each bar uses the same actual measured performance, but compares it to the requirements for two different times (July and October '08). Thus if the requirements increase, the same measured performance will be lower in comparison.



Interpretation: 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**

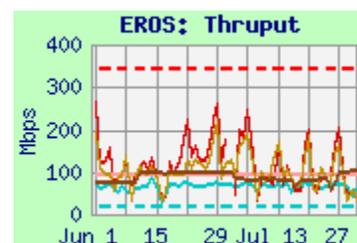
Web Page: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	191.4	98.7	25.4	57.7	129.0
GSFC-DAAC → EROS LPDAAC	234.8	87.8	29.2		
ERSDAC → EROS LPDAAC	80.1	66.2	23.5	7.5	69.5
GSFC-EBnet-PTH → EROS PTH	318.6	78.4	24.2		
GSFC-ENPL → EROS PTH	479.8	440.2	304.8		
NSIDC → EROS	85.8	82.2	73.7		
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

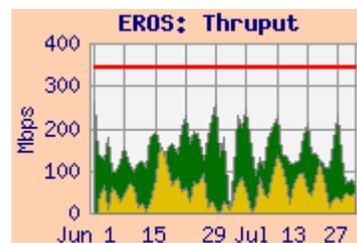


Comments:

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 51 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 month, and remains more than 30% below the requirement so the rating remains "Low".



The GSFC-ENPL host has a direct connection to the MAX, bypassing the congested EBnet to Doors Gig-E circuit -- using the previous Internet2 route. It does not experience similar congestion to the DAAC. Performance from ENPL is much higher (peak performance is more than twice that of MODAPS, but the daily worst is better by a factor of almost 10:1), and would be rated "Good".

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

NSIDC → EROS: The route from NSIDC-SIDADS to EROS-PTH switched back to Internet2 from Chicago to Salt Lake City for most of July (had used NLR between Chicago and Denver for most of June), so the performance dropped slightly, due to the higher RTT.

LaRC → EROS: The thrupt from LaRC-PTH to EROS-PTH was again very stable this month via NISN to the Chicago CIEF. Thrupt 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:

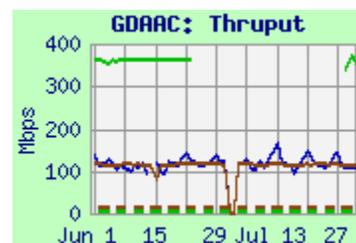
- <http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>
- http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
EROS LPDAAC → GSFC DAAC	153.1	115.8	85.6		
EROS PTH → GSFC PTH	454.0	422.1	355.7		
JPL-PTH → GSFC PTH	66.3	65.8	63.4	0.9	
LDAAC → GDAAC	445.5	354.5	202.3	0.19	354.5
LARC-ANGe → GSFC-PTH	377.6	346.2	281.1		
NSIDC DAAC → GSFC-DAAC	116.4	115.2	110.5	0.31	

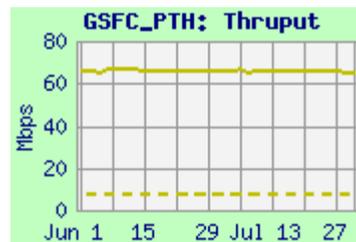
Requirements:

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 3 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”.



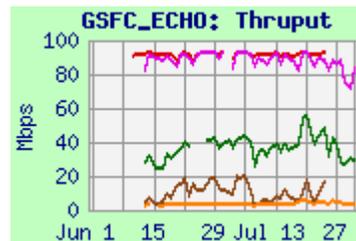
LaRC → GSFC: Performance from LDAAC → GDAAC improved with retuning in November '07, and remained much more than 3 x the modest requirement, so the rating continues as “Excellent”. The user flow was about the same as recent months.

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 about 300 kbps.

2.2 GSFC-ECHO

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	71.6	50.3	21.6
EROS LPDAAC ftp	8.2	7.6	3.7
GES DAAC	93.4	92.1	85.1
GES DAAC ftp	93.2	88.4	63.0
NSIDC DAAC	19.7	8.4	2.0
NSIDC DAAC ftp	4.1	3.9	2.2
LaRC ASDC DAAC	44.9	38.4	21.5



Testings 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	280.7	85.7	27.7	31.0	94.1
GSFC-DAAC → JPL-AIRS	120.0	76.9	35.2		
GSFC-PTH → JPL-PODAAC	221.4	44.2	14.1		
GSFC-PTH → JPL-QSCAT	91.7	36.8	11.9		
GSFC-PTH → JPL-MLS	127.0	25.3	8.6		
GSFC-NISN → JPL-MLS	113.1	91.1	82.5		

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.

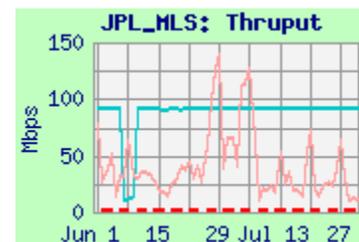
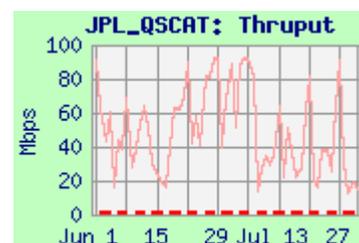
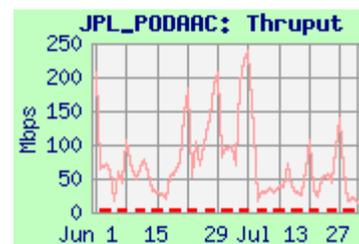
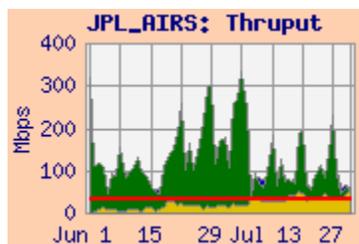
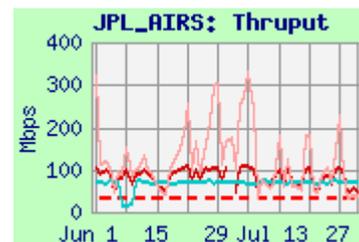
The EBnet to Doors congestion at GSFC is the bottleneck for most of these flows, and creates large variations in performance (After the NISN to JPL campus connection upgrade to Gig E in September '07). The user flow from GSFC/EOS was quite a bit higher than last month's 12.3 mbps, and was very close to the requirement without contingency.

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

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

QSCAT: The median thrupt from GSFC-PTH now 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 improved a bit from 34 mbps last month; the rating remains "Excellent". Testing from GSFC-NISN avoids the EBnet congestion seen from GSFC-PTH –although the peaks were lower, 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

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC DAAC → JPL-TES	252.2	214.5	52.9
LaRC PTH → JPL-TES	91.3	91.3	91.2
LaRC PTH → JPL-TES sftp	3.5	3.5	3.4
LaRC PTH → JPL-PTH sftp	34.0	34.0	33.9
LaRC DAAC → JPL-MISR	88.7	79.0	7.1
LaRC PTH → JPL-MISR	90.1	86.0	48.6
JPL-PTH → LaRC PTH	64.1	63.9	59.1

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

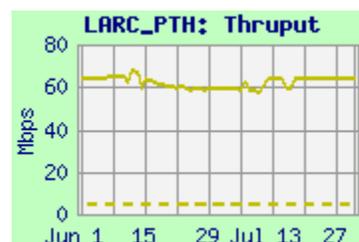
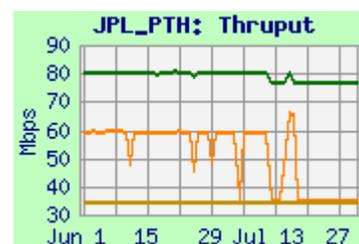
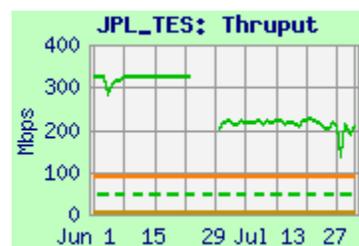
Comments: Note: The old LaRC ASDC DAAC test node was retired in late June – testing from its replacement began July. Performance levels are a bit lower from this node, although still well above the requirements.

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 and stabilized 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 performance increased with that upgrade – but declined in mid-March again due to TCP window limitations. Sftp results are much better from LaRC-PTH to JPL-PTH which does use the larger window size.

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

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	89.0	84.9	35.2	4.9	85.0
GSFC-DAAC → NSIDC-DAAC	106.2	46.8	12.8		
GSFC-ENPL → NSIDC_u	114.3	113.8	95.7		
GSFC-ISIPS → NSIDC (iperf)	n/a	n/a	n/a		
GSFC-ISIPS → NSIDC (ftp)	n/a	n/a	n/a		

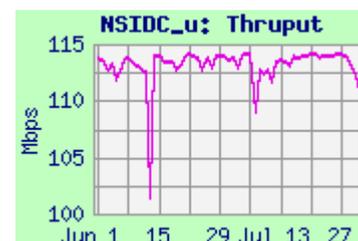
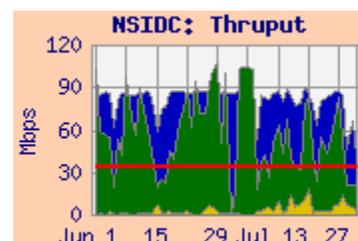
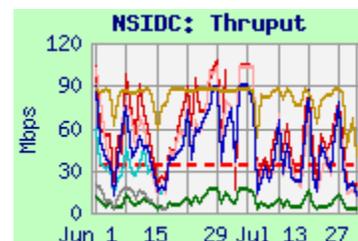
Requirements:

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 (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 was steady and well above the requirement – it would rate “Excellent”. So from a performance viewpoint, it appears that this is a viable option. Additional testing via Internet2-- from MODAPS -- will be initiated in August.

GSFC-ISIPS ← NSIDC: Testing stopped working in mid-June, blocked by the EBnet firewall (firewall request has been initiated). FTP testing has been restarted in August, but iperf testing is still down.



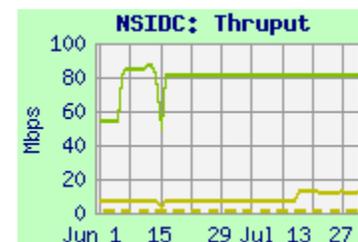
4.2) JPL → NSIDC:

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	42.7	1.34
JPL PODAAC → NSIDC	12.6	6.5	6.1	

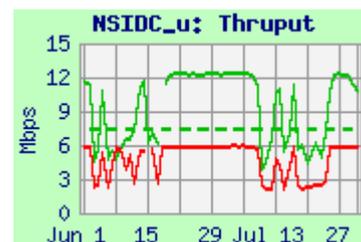
Comments: The test from JPL-PTH to NSIDC-PTH more fully assesses the true network capability – the thrupt is much higher than from PODAAC. Thrupt from JPL-PTH increased last month – back to its higher bimodal value. Thrupt from PODAAC to NSIDC-SIDADS was much lower but stable. User flow is now measured on this path: only about 20 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains “Excellent”.



4.3) GHRC → NSIDC:Ratings: GHRC → NSIDC: Continued **Good**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)	12.4	11.0	3.2	7.5
GHRC → NSIDC DAAC (ftp)	5.9	5.8	2.0	

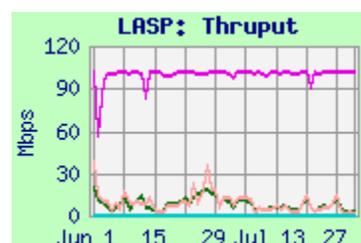
Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via NISN PIP. The thrupt was noisy this month, but the median remains more than 30 % over the requirement, so is rated "Good". The user flow averaged only 750 kbps this month, 10% of the requirement.

**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
ASF → LASP	n/a	n/a	n/a	0.024
GSFC EDOS → LASP	16.1	6.0	1.9	0.4
GSFC PTH → LASP (iperf)	14.4	5.5	1.5	
GSFC ENPL → LASP	101.9	101.2	76.9	
GSFC PTH → LASP (sftp)	0.46	0.45	0.42	

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 thrupt is very noisy (note the 10:1 best:worst ratio from GSFC-PTH). This is attributed to EBnet congestion at GSFC, but since the thrupt is well above the requirement, the rating continues "Excellent". Sftp thrupt is steady but MUCH lower than iperf, due to window size limitations -- a patch is available. Performance is much higher and steadier from GSFC-ENPL via Internet2, which avoids the EBnet congestion at GSFC. The user flow on IOnet via 83 kbps this month, similar to recent months.

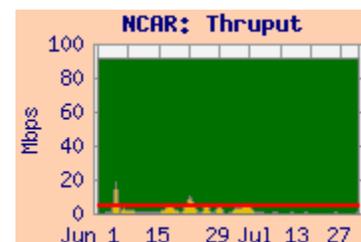
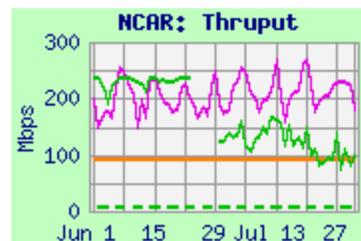
**4.5) NCAR:**Ratings: LaRC → NCAR: Continued **Excellent**GSFC → NCAR: Continued **Excellent**Web Pages: <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>**Test Results:**

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
LaRC → NCAR	179.0	124.1	33.7	5.4
GSFC-ENPL → NCAR	295.9	209.4	92.1	5.1

Comments: NCAR (Boulder, CO) is a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS QA (Aura, from GSFC) requirements. Thrupt from LaRC improved in April with NCAR's use of NLR instead of Internet2 for the return path, reducing the RTT. I then dropped 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 thrupt 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 somewhat consistent with the stated requirement. The average user flow this month was about 0.5 mbps (vs 0.9 mbps last month).



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

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GDAAC → LDAAC	443.7	301.1	161.8	9.4	304.5
GSFC-EDOS → LDAAC	n/a	n/a	n/a		
GSFC-NISN → LaTIS	404.3	388.5	317.9		
GSFC-PTH → LaRC-ANGe	385.1	257.1	137.9		

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 from its replacement began in July.

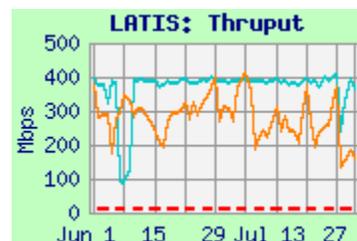
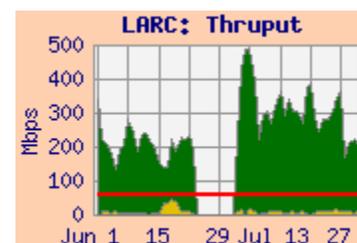
GSFC → LaRC: The requirement was reduced effective January '08 due to decreased GEOS flows (was 86.9 mbps previously). The rating is based on the GDAAC to LaRC ASDC DAAC thrupt, compared to this combined requirement. The integrated thrupt increased this month with the new host at LARC – it remains more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

The 9.4 mbps average user flow was lower than last month's 13 mbps, and well below the requirement. **Significant GEOS flows are apparently still NOT occurring at this time.**

LaTIS: The thrupt to LaTIS via PIP (from GSFC-PTH) was again noisy due to EBnet congestion at GSFC, but mostly stable this month. Testing 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	4.14	3.33	2.33	0.44	3.40
GSFC-ENPL → JAXA-azusa	74.2	61.5	39.0		
GSFC-PTH → JAXA-azusa	40.9	20.6	5.4		
GSFC-EDOS → JAXA-azusa	39.1	16.9	5.2		
GSFC-PTH → JAXA (sftp)	0.83	0.78	0.57		
JAXA-DDS → JPL-QSCAT	3.19	3.14	2.00		
JAXA-DDS → GSFC-DAAC	1.09	1.09	1.08		
JAXA-azusa → GSFC-MAX	86.0	85.5	24.5		

Requirements:

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

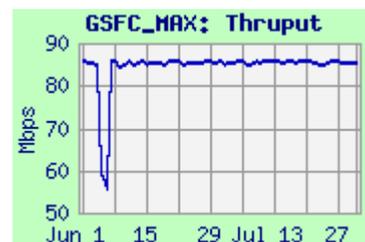
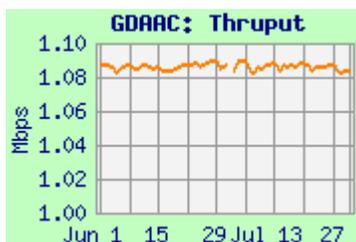
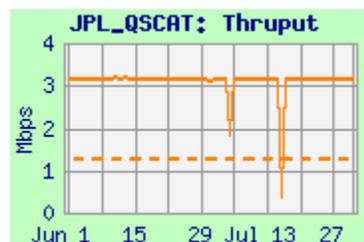
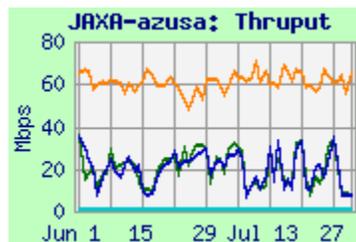
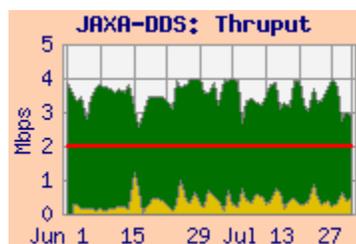
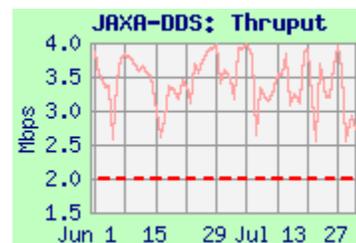
Comments:

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, but by less than 3x; so the rating remains “Good”.

The integrated graph shows fairly consistent user flow, averaging about 22% of the requirement (or 33% 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 thrupt using sftp between these same nodes is much lower, limited by ssh window size. A patch is available, but is not installed

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



7) ERSDAC ↔ US:

Ratings: GSFC → ERSDAC: Continued **Excellent**
 ERSDAC → EROS: Continued **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	83.2	37.2	12.4	4.1	39.2
GDAAC → ERSDAC	26.1	17.0	7.8		
GSFC ENPL (FE) → ERSDAC	88.5	88.5	77.5		

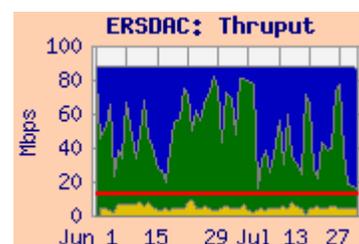
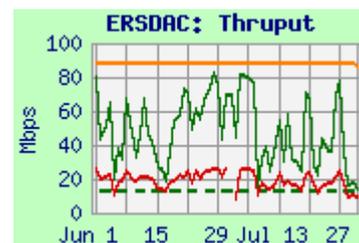
Requirements:

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 stable this month, the rating remains "Excellent". The integrated chart shows that the user flow continues to be below the requirement, by about a 3:1 factor.

The throughput 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	89.8	89.7	6.7
ERSDAC → EROS	80.1	66.2	23.5

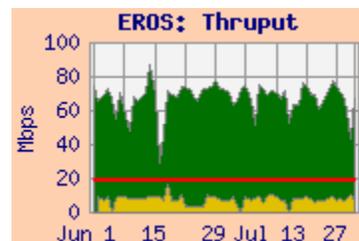
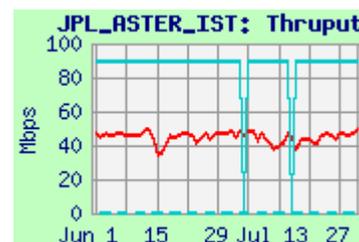
Requirements:

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. Throughput improved to this present values in April '05. The median throughput is about 2 x the requirement, so the rating remains "Good". This user flow was steady at 7.5 mbps this month (was 7.8 mbps last month), about 30% of the requirement.



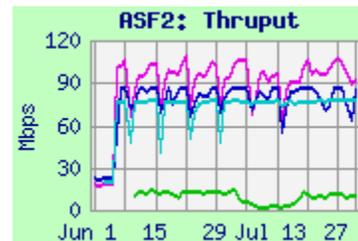
8) ASF

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	78.1	76.8	49.6
GSFC	115.0	96.1	72.6
JAXA	86.5	83.6	32.6



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 was mostly stable in May. If the 20 mbps requirement is correct, the rating would be "Excellent"

9) Other SIPS Sites:

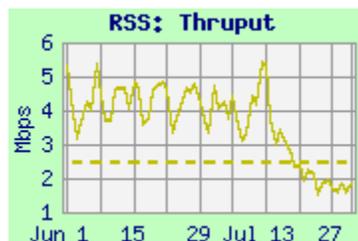
Web Pages <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			Reqmt	Rating
	Best	Median	Worst		
JPL → RSS	5.6	3.1	1.0	2.5	↓ Good → Adequate
OMISIPS → KNMI-ODPS	17.8	16.0	9.2	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 remains above the requirement, but now by less than 30%, so the rating drops to "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 2.3 mbps this month, about normal for recent months, and consistent with the requirement, as shown on the integrated graph.

