EOS Production Sites
Network Performance Report

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

Highlights:

- **Mostly stable flows with continued congestion at GSFC**
  - GPA 3.47 (Last month: 3.37)
- **Only 1 flow below "Good"**
  - **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: ↑

GSFC → LaRC: Good → **Excellent**
EDOS → ERSDAC: Good → **Excellent**

Downgrades: ↓: None

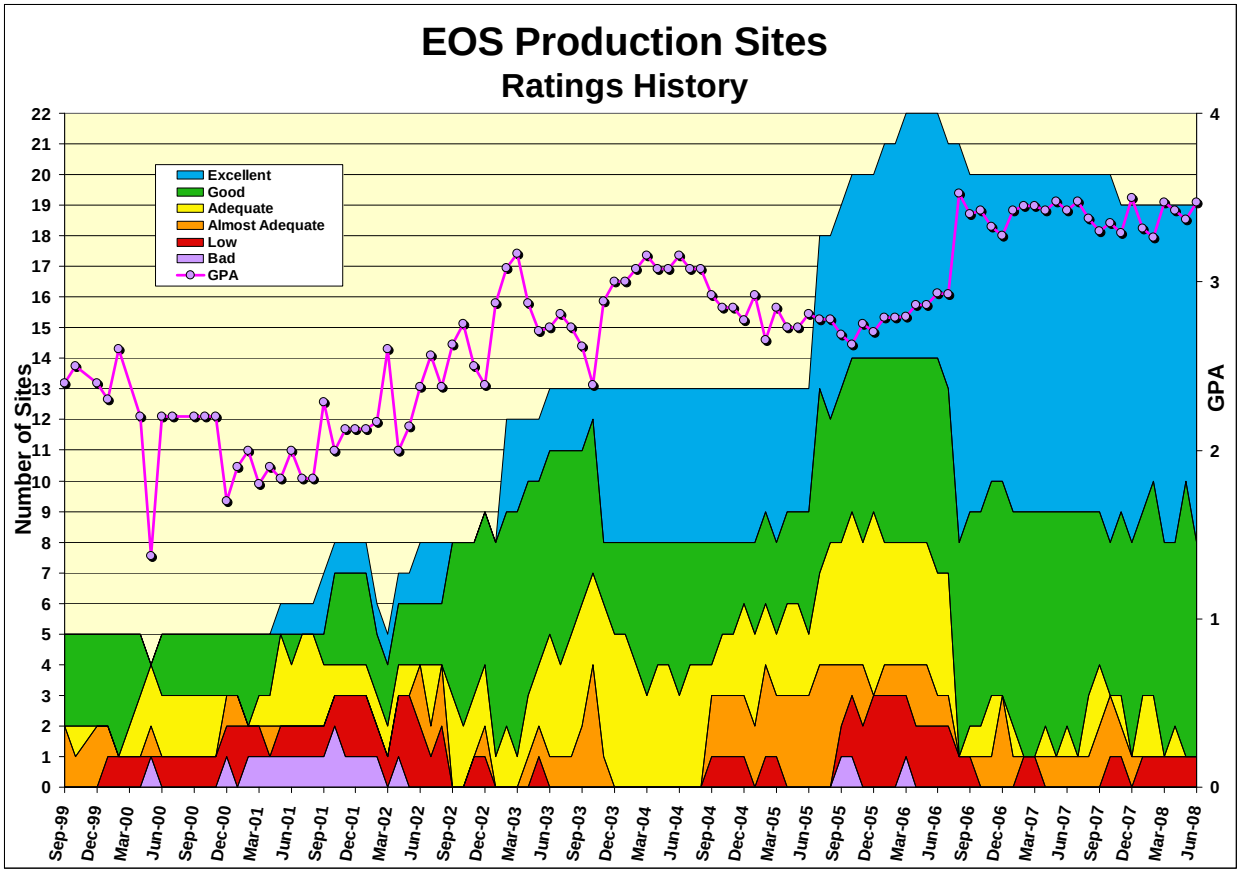
Testing Down X**:**

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

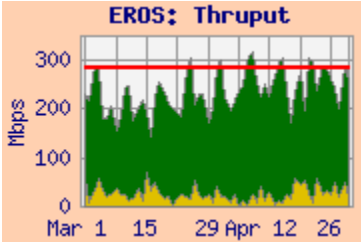


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

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 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. 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

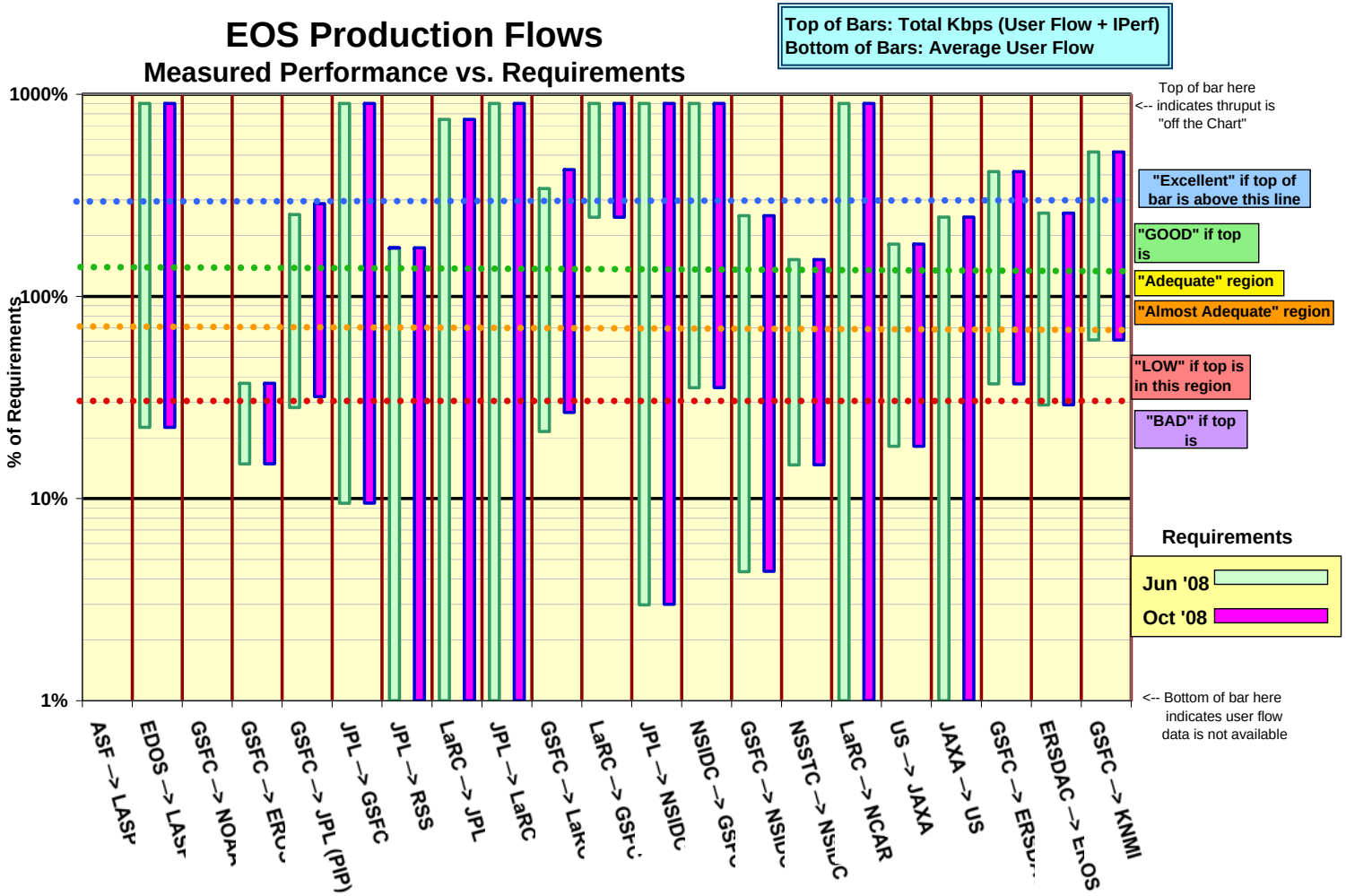
June 2008		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current Jun-08	Future Oct-08	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements Jun-08	Rating re Current Requirements Last Month	Rating re Oct-08
WSC –> ASF	ALOS	n/a	n/a	WSC → ASF-AADN		76.4		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]	0.09	8.6		Excellent	E	Excellent
GSFC –> EROS	MODIS, LandSat	345.9	345.9	MODAPS-PDR → EROS LPDAAC	51.3	97.8	128.6	LOW	L	LOW
GSFC –> JPL (PIP)	AIRS, MLS, ISTs	43.6	38.5	GSFC-PTH → JPL-AIRS	12.3	109.6	110.8	GOOD	G	GOOD
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	0.7	65.9		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		4.3		GOOD	G	GOOD
LaRC –> JPL	TES, MISR	43.2	43.2	LARC-DAAC → JPL-TES		324.8		Excellent	E	Excellent
JPL –> LaRC	TES	4.4	4.4	JPL-PTH → LARC-PTH		62.3		Excellent	E	Excellent
GSFC –> LaRC	CERES, MISR, MOPITT	60.5	48.7	GDAAC → LDAAC	13.0	206.5	206.5	Excellent	G	Excellent
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.5	361.0	361.0	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.04	81.6		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	0.5	0.5	NSIDC DAAC → GDAAC	0.17	115.3	115.3	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	34.5	34.5	MODAPS-PDR → NSIDC-DAAC	1.5	86.6	86.6	GOOD	G	GOOD
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	1.1	11.3	11.4	GOOD	G	GOOD
LaRC –> NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		232.8		Excellent	E	Excellent
US –> JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.36	3.5	3.6	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	50.4	51.6	Excellent	G	Excellent
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	7.8	66.5	69.3	GOOD	G	GOOD
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → ODPS	2.0	16.7	17.0	Excellent	E	Excellent

*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

Ratings Summary	Jun-08 Req Score	Jun-08 Req Prev	Oct-08 Req Score
Excellent	11	9	11
GOOD	7	9	7
Adequate	0	0	0
Almost Adequate	0	0	0
LOW	1	1	1
BAD	0	0	0
Total Sites	19	19	19
GPA	3.47	3.37	3.47

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

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 (June 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**

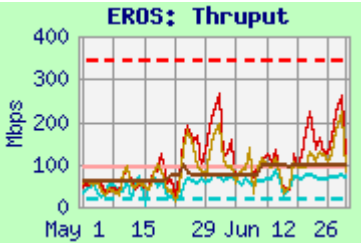
Web Page: http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

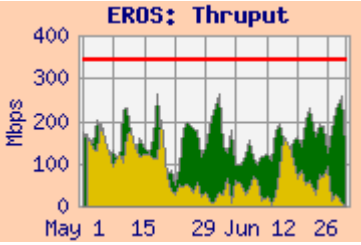
Test Results:

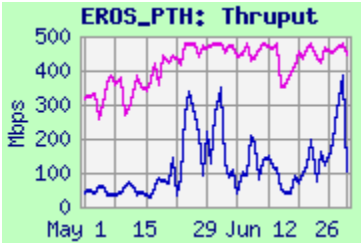
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
MODAPS-PDR→ EROS LPDAAC	190.2	97.8	32.5	51.3	128.6
GSFC-DAAC → EROS LPDAAC	239.2	122.6	38.0		
ERSDAC→ EROS LPDAAC	79.4	66.5	26.1	7.8	69.3
GSFC-EBnet-PTH → EROS PTH	384.9	113.4	25.5		
GSFC-ENPL → EROS PTH	480.0	454.9	309.8		
NSIDC→ EROS	102.0	97.6	74.8		
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 (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 below the 94 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, and 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 steady and a bit less noisy 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 used NLR between Chicago and Denver (rather than Internet2 from Chicago to Salt Lake City) for most of June, so the performance improved due to the lower RTT.

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

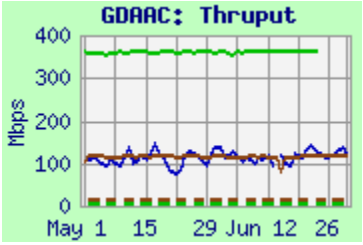
Web Pages:
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

Test Results:

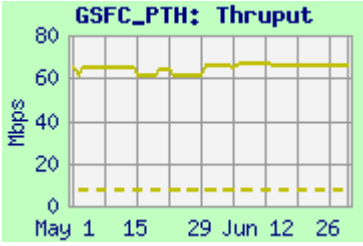
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
EROS LPDAAC → GSFC DAAC	145.2	116.2	91.5		
EROS PTH→ GSFC PTH	445.7	414.2	333.6		
JPL-PTH→ GSFC PTH	66.4	65.9	64.2	0.7	
LDAAC → GDAAC	371.1	361.0	328.7	0.45	361.0
LARC-ANGe → GSFC-PTH	374.2	344.0	273.3		
NSIDC DAAC → GSFC-DAAC	116.7	115.3	109.6	0.17	

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 thruput 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: Thruput was stable at 65 mbps for the last 2 months (but has been bimodal at either 65 or 90 mbps, since 2007 (thruput from JPL-PTH to LaRC-PTH is similar). With the modest requirement, the rating remains "Excellent".

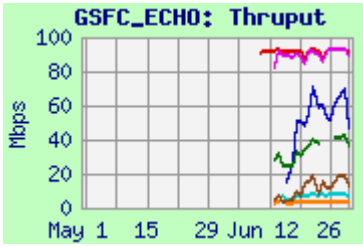
LaRC → GSFC: Performance from LDAAC → GDAAC improved with retuning in November, and remained much more than 3 x the modest requirement, so the rating continues as "Excellent". The user flow was about the same as recent months.

NSIDC → GSFC: Performance from NSIDC to GSFC was steady this month; with the low requirement the rating remains "Excellent". The user flow on this path is now measured – it again averaged under 100 kbps.

2.2 GSFC-ECHO

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	73.7	53.4	28.3
EROS LPDAAC ftp	8.1	7.3	4.2
GES DAAC	93.5	92.0	86.4
GES DAAC ftp	93.6	90.4	67.4
NSIDC DAAC	19.8	11.7	2.2
NSIDC DAAC ftp	4.1	3.8	2.5
LaRC ASDC DAAC	42.3	34.7	20.2



Testing was added to GSFC-ECHO this month 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:

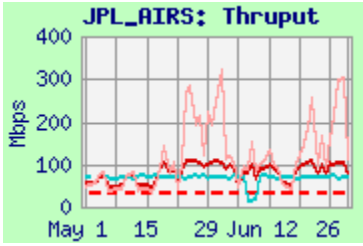
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

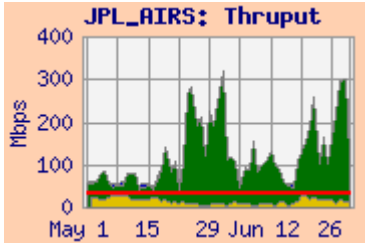
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-PTH → JPL-AIRS	316.3	109.6	29.2	12.3	110.8
GSFC-DAAC→ JPL-AIRS	121.3	91.0	35.8		
GSFC-PTH → JPL-PODAAC	231.6	63.6	16.1		
GSFC-PTH → JPL-QSCAT	91.8	52.2	12.5		
GSFC-PTH → JPL-MLS	145.9	33.9	9.1		
GSFC-NISN → JPL-MLS	105.9	91.1	81.8		

Requirements:

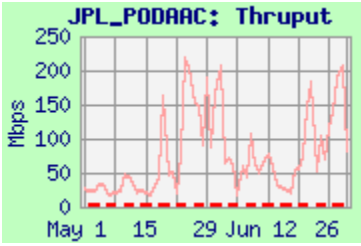
Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	Jan-May '08	**43.6**	**Good**
GSFC → JPL AIRS	Jan-May '09	35.2	**Excellent**
GSFC → JPL MLS	Jan-May '08	5.9	**Excellent**
GSFC → JPL PODAAC	Jan-May '11	1.5	**Excellent**
GSFC → JPL QSCAT	Jan-May '11	1.0	**Excellent**



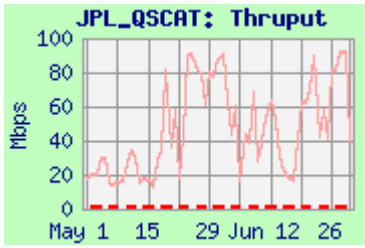


Comments: The GSFC to JPL combined requirement was reduced in Jan '08, due mostly to revision of the GEOS 5 flows (the requirement was 113 mbps previously). The rating upgrade in April was substantially due to this requirements decrease – the measured performance was mostly consistent.

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 higher than last month's 15.7mbps, and was below the requirement without contingency.



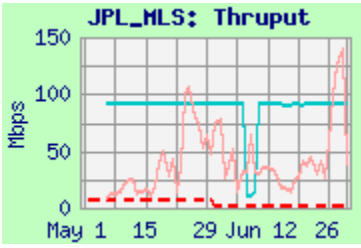
AIRS, Overall: The median thruput from GSFC-PTH is now a bit more than 3x the AIRS requirement; so the rating is now "Excellent". **The JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the overall rating remains "Good"



PODAAC: Thruput peaks are now over 200 mbps. Median thruput 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 thruput 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 7.4 mbps requirement is for MLS and GEOS flow, and was reduced in April. Thruput from GSFC-PTH improved from 26 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**

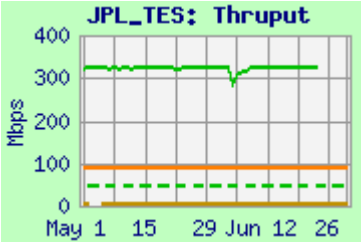
Web Pages:
http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtml
http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

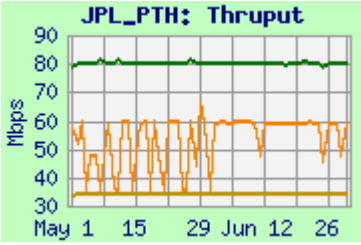
Test Results:

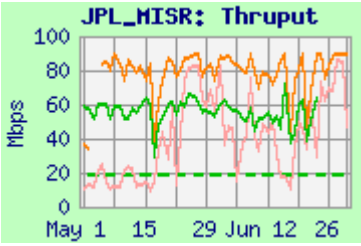
Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
LaRC DAAC → JPL-TES	326.7	324.8	276.2
LaRC PTH → JPL-TES	91.3	91.3	91.2
LaRC PTH → JPL-TES sftp	3.5	3.5	3.4
LaRC PTH → JPL-PTH sftp	34.1	34.0	33.9
LaRC DAAC → JPL-MISR	75.4	54.2	27.9
LaRC PTH → JPL-MISR	90.2	82.8	46.9
JPL-PTH → LaRC PTH	64.1	62.3	58.5

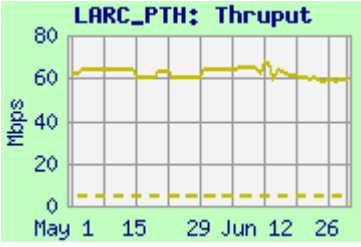
Requirements:

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 was not enabled until July.**

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 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:

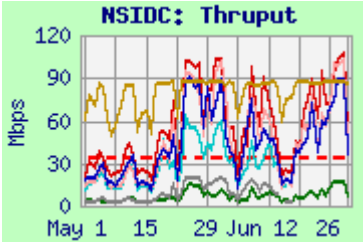
4.1) GSFC → NSIDC:

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

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

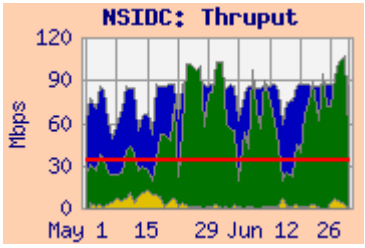
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODIS-PDR → NSIDC-DAAC	88.9	86.6	38.1	1.5	86.6
GSFC-DAAC → NSIDC-DAAC	107.7	61.4	13.0		
GSFC-ENPL → NSIDC_u	114.2	113.4	96.2		
GSFC-ISIPS → NSIDC (iperf)	61.3	28.9	6.7		
GSFC-ISIPS → NSIDC (ftp)	19.8	10.9	1.4		

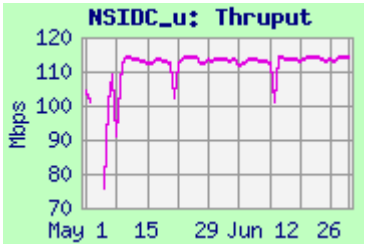


Requirements:

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 thruput 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 thruput 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. Thruput 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.

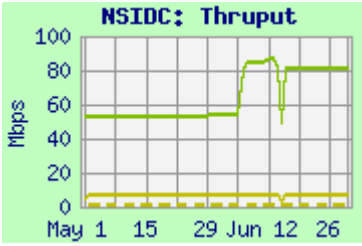
GSFC-ISIPS ← → NSIDC: Testing stopped working in mid-June, blocked by the EBnet firewall (firewalll request has been initiated). Testing was retuned in December, and has been stable since then, subject to the EBnet congestion at GSFC. FTP thruput was much lower than iperf due to TCP window size limitations.

4.2) JPL → NSIDC:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
JPL PTH → NSIDC-PTH	81.6	81.6	53.4	1.34
JPL PODAAC → NSIDC	7.0	6.6	4.6	



Comments: The test from JPL-PTH to NSIDC-PTH more fully assesses the true network capability – the thruput is much higher than from PODAAC. Thruput from JPL-PTH increased this month – back to its higher bimodal value -- much like the JPL-PTH to GSFC and LaRC results. Thruput from PODAAC to NSIDC-SIDADS was much lower but stable. User flow is now measured on this path: only about 40 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".

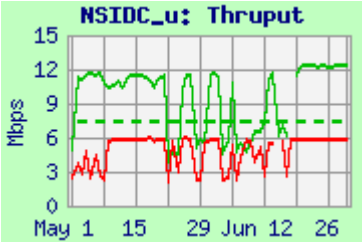
4.3) GHRC → NSIDC:

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	11.3	2.9	7.5
GHRC → NSIDC DAAC (ftp)	5.9	5.8	2.2	



Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via NISN PIP. The thruput was noisy this month, but the median remains more than 30 % over the requirement, so is rated "Good". The user flow averaged only 1.1 mbps this month, about 14% of the requirement.

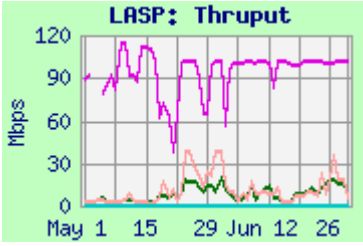
4.4) LASP:

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	23.9	8.6	1.9	0.4
GSFC PTH → LASP (iperf)	38.5	8.9	1.8	
GSFC ENPL → LASP	101.8	101.0	75.7	
GSFC PTH → LASP (sftp)	0.46	0.45	0.41	



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 thruput is very noisy (note the 20:1 best:worst ratio from GSFC-PTH). This is attributed to EBnet congestion at GSFC, but sine the thruput is well above the requirement, the rating continues "Excellent". Sftp thruput is steady but MUCH lower than iperf, due to window size limitations -- a patch is available. In March, an additional test was initiated from GSFC-ENPL via Internet2, avoiding the EBnet congestion at GSFC and the IOnet circuit. Its performance is much higher and steadier. The user flow on IOnet averaged 87 kbps this month, similar to recent months.

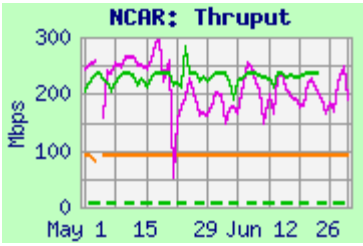
4.5) NCAR:

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

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

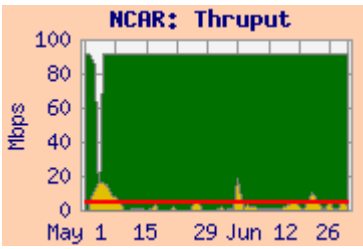
Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Requirement**
LaRC → NCAR	237.8	232.8	107.0	5.4
GSFC-ENPL → NCAR	295.0	195.5	85.8	5.1



Comments: NCAR (Boulder, CO) is a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS QA (Aura, from GSFC) requirements. Thruput from LaRC improved in April with NCAR's use of NLR instead of Internet2 for the return path, reducing the RTT. It is well above 3 x the requirement, so the rating remains "Excellent".

From GSFC-ENPL, with a Gig-E connection to MAX, the median thruput 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 0.9 mbps (vs 1.4 mbps last month).

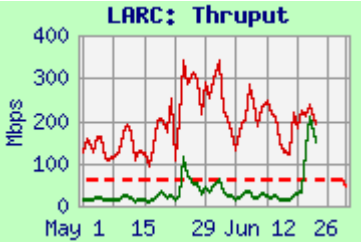
5) GSFC → LaRC:

Rating: ↑ Good → **Excellent**

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

Test Results:

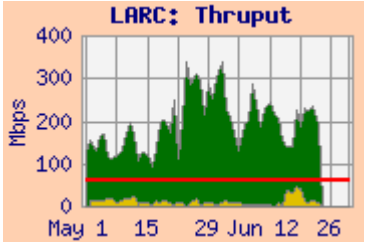
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	356.9	206.5	68.3	13.0	206.5
GSFC-EDOS → LDAAC	90.2	25.5	9.3		
GSFC-NISN → LaTIS	401.9	387.1	283.8		
GSFC-PTH → LaRC-ANGe	407.2	291.9	151.9		



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 was not enabled until July.**



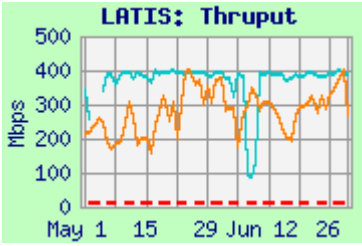
GSFC → LaRC: The requirement was reduced effective January '08 due to decreased GEOS flows (was 86.9 mbps previously). The rating is based on the GDAAC to LaRC ASDC DAAC thruput, compared to this combined requirement. The integrated thruput increased this month to more than 3 x this decreased requirement, so the rating remains improves to "Excellent"

Performance from EDOS is much lower that from GDAAC, and even noisier, due to additional firewalls to traverse.

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

The13 mbps average user flow was a bit higher than last month's 11 mbps. The integrated graph shows that user flow was fairly steady. **Significant GEOS flows are apparently still NOT occurring at this time.**

LaTIS: The thruput 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.



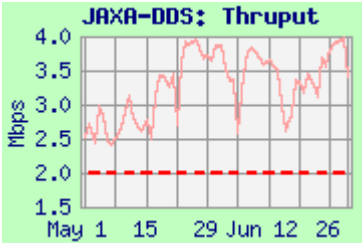
6) US ←→ JAXA:

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

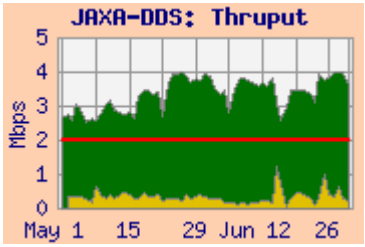
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.15	3.53	2.37	0.36	3.57
GSFC-ENPL → JAXA-azusa	72.1	60.0	42.3		
GSFC-PTH → JAXA-azusa	33.6	21.8	5.8		
GSFC-EDOS → JAXA-azusa	35.0	21.4	4.2		
GSFC-PTH → JAXA (sftp)	0.83	0.80	0.63		
JAXA-DDS → JPL-QSCAT	3.19	3.16	3.05		
JAXA-DDS → GSFC-DAAC	1.09	1.09	1.08		
JAXA-azusa→ GSFC-MAX	85.9	85.4	22.3		



Requirements:

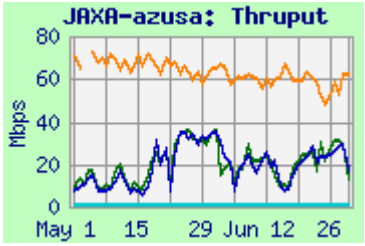
Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Mar '08	1.99	Good
JAXA → US	Nov '03 – Mar '08	1.28	Good



Comments:

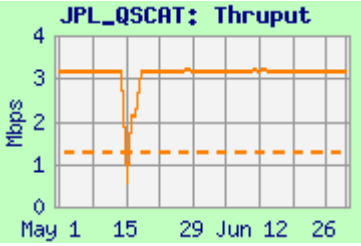
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Performance was mostly stable this month, but subject to the EBnet to Doors congestion at GSFC. Thruput was above the requirement, but by less than 3x; so the rating remains "Good".

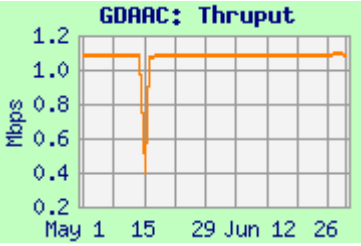
The integrated graph shows fairly consistent user flow, averaging about 18% of the requirement (or 27% of the requirement without the contingency).

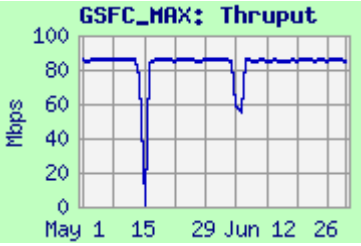


Azusa: Performance from GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH and GSFC-EDOS is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp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







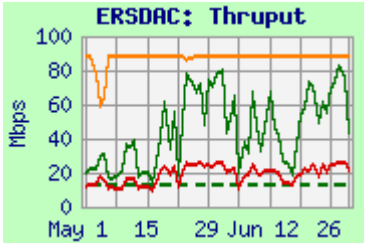
7) ERSDAC ←→ US:

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

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

US → ERSDAC Test Results

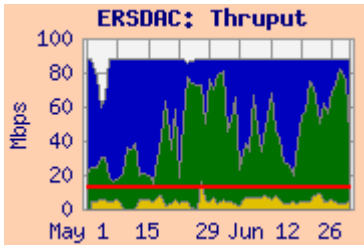
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-EDOS → ERSDAC	84.1	50.4	13.8	4.5	51.6
GDAAC → ERSDAC	26.2	20.8	8.5		
GSFC ENPL (FE) → ERSDAC	88.5	88.5	76.8		



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.

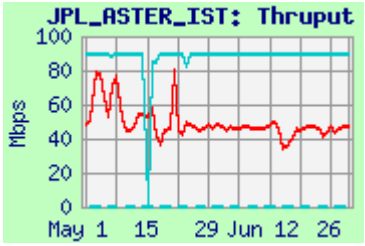


Testing from EDOS to ERSDAC is used as the basis for the rating -- the requirement includes the level 0 flows which used to be sent by tapes. Performance improved this month, due to lower EBnet to Doors congestion, the rating improves to "Excellent". The integrated chart shows that the user flow continues to be below the requirement, by about a 3:1 factor.

The thruput 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	77.3
ERSDAC → EROS	79.4	66.5	26.1

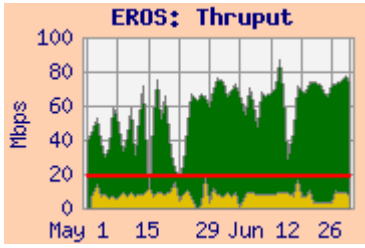


Requirements:

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. Thruput improved to this present values in April '05. The median thruput is about 2 x the requirement, so the rating remains "Good". This user flow was 7.8 mbps this month (was 8.3 mbps last month), about 30% of the requirement.

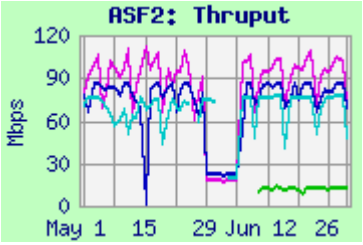
8) ASF

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	77.8	76.4	54.0
GSFC	110.4	95.0	64.5
JAXA	86.5	80.4	21.7



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"

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9) Other SIPS Sites:

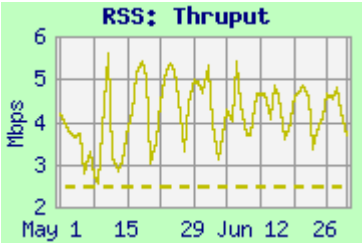
Web Pages http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

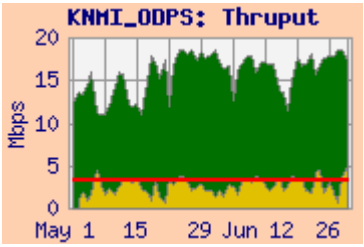
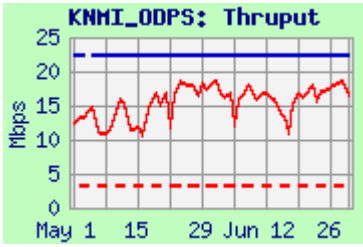
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	5.7	4.3	1.8	2.4	Continued **Good**
OMISIPS → KNMI-ODPS	18.7	16.7	8.6	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 thruput 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 thruput remains above the requirement, by more than 30%, so the rating remains "Good".



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 2.0 mbps this month, about normal for recent months, and consistent with the requirement, as shown on the integrated graph.