EOS Production Sites
Network Performance Report

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

Highlights:

- **Mostly stable flows with continued (increasing) congestion at GSFC**
  - GPA 3.32 (Last month: 3.50)
- **Only 1 flow below "Adequate"**:
  - **GSFC GES DAAC to EROS** ("**Low**")
    - Due to congestion at GSFC
    - Requirements are under review
- **Bottlenecks:**
  - GSFC: EBnet to Doors Gig-E
  - JPL: AIRS TLCF to campus LAN – **fixed!**
- **Requirements Update:** still in progress – to be based on "Actuals".
- Significant changes in testing are indicated in Blue, Problems in Red

Ratings Changes: (See site discussion below for details)

Upgrades: ↑: None

Downgrade: ↓

GSFC → EROS: Almost Adequate → **Low**

GSFC → NSIDC: Good → **Adequate**

GSFC → JPL: Excellent → **Adequate**

(performance stable, but requirements increased)

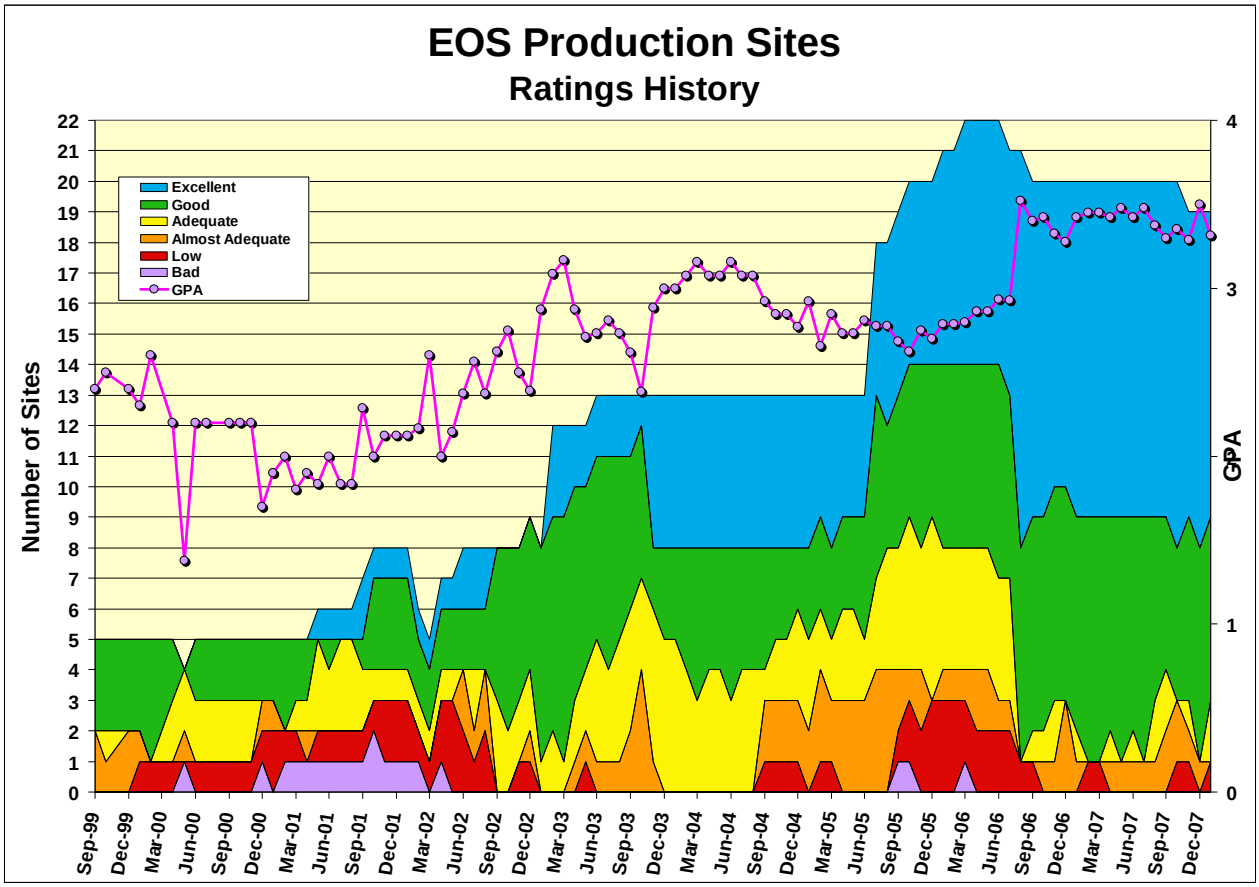
Testing Down X:

ASF → LASP, GSFC → ASF (ASF IOnet 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

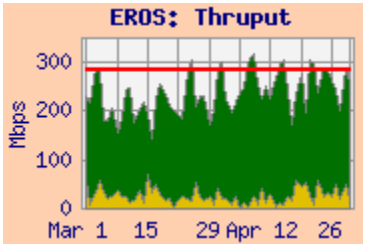


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

Requirements Basis:

- 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

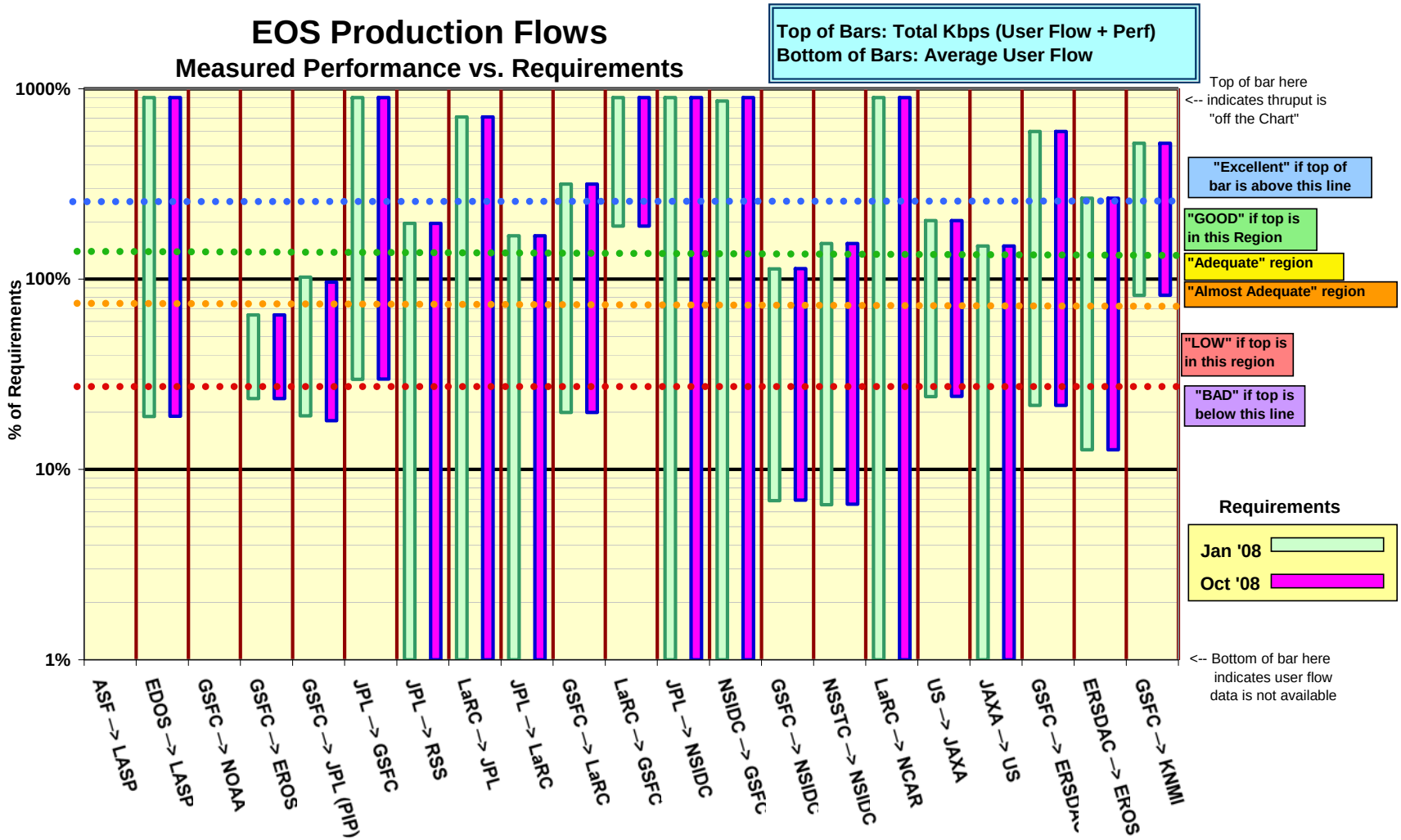
January 2008		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current	Future	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements		Rating re
		Jan-08	Oct-08					Jan-08	Last Month	Oct-08
GSFC –> ASF	QuikScat, Radarsat	n/a	n/a	GSFC-PTH → ASF				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]	0.076	13.3		Excellent	E	Excellent
GSFC –> EROS	MODIS, LandSat	285.4	285.4	MODAPS-PDR → EROS LPDAAC	68.7	151.8	185.7	LOW	A A	LOW
GSFC –> JPL (PIP)	AIRS, ISTs	113.8	121.0	GSFC-PTH → JPL-PODAAC	21.8	111.2	116.5	Adequate	E	A A
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	2.2	89.2		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		4.9		GOOD	G	GOOD
LaRC –> JPL	TES, MISR	43.2	43.2	LARC-DAAC → JPL-TES		307.6		Excellent	E	Excellent
JPL –> LaRC	TES	52.6	52.6	JPL-PTH → LARC-PTH		88.9		GOOD	G	GOOD
GSFC –> LaRC	CERES, MISR, MOPITT	86.9	86.9	GDAAC → LDAAC	17.3	273.3	274.1	Excellent	E	Excellent
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.4	359.1	359.1	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.007	88.2		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	13.3	0.5	NSIDC DAAC → GDAAC	0.00001	114.9	114.9	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	64.1	64.0	GDAAC → NSIDC-DAAC	4.4	72.1	72.6	Adequate	G	Adequate
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.5	11.5	11.5	GOOD	G	GOOD
LaRC –> NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		173.3		Excellent	E	Excellent
US –> JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.48	3.97	4.03	GOOD	G	GOOD
JAXA –> US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		1.91		GOOD	G	GOOD
GSFC –> ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	2.7	72.7	74.2	Excellent	E	Excellent
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	3.4	70.1	71.4	GOOD	G	GOOD
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → OMI-PDR	2.7	16.8	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	Jan-08 Req Score	Jan-08 Req Prev	Oct-08 Score
Excellent	10	11	10
GOOD	6	7	6
Adequate	2	0	1
Almost Adequate	0	1	1
LOW	1	0	1
BAD	0	0	0
Total Sites	19	19	19
GPA	3.32	3.50	3.29

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 (January 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 include a 50% contingency factor above what was specified by the projects, so a value of 66% would indicate that the project is flowing as much data as requested. The top of each bar represents the integrated measurement – this value is used to determine the ratings.

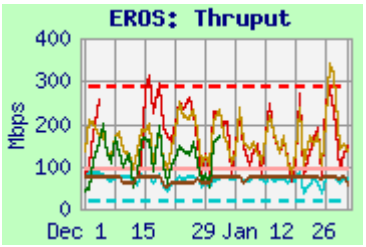
1) EROS:

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

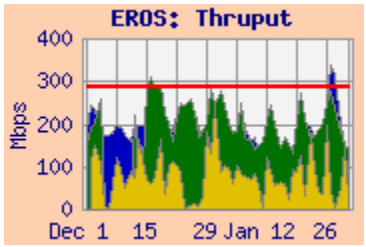
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
MODAPS-PDR→ EROS LPDAAC	240.3	151.8	58.8	68.7	185.7
GSFC-DAAC → EROS LPDAAC	252.4	150.5	45.5	67.3	184.8
ERSDAC→ EROS LPDAAC	81.8	70.1	35.0	3.4	71.4
GSFC-PTH → EROS PTH	465.3	196.6	42.5		
GSFC-ENPL → EROS PTH	483.1	457.4	323.9		
NSIDC→ EROS	75.5	73.9	71.4		
LaRC→ EROS	93.0	93.0	92.8		
EROS LPDAAC → GSFC DAAC	165.8	121.4	93.4		
EROS PTH→ GSFC PTH	464.0	437.8	393.0		



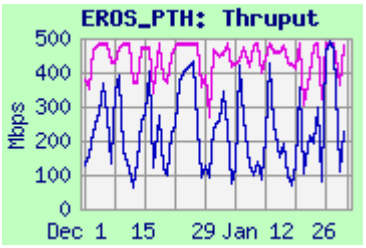
Requirements:

Source → Dest	Date	mbps	Rating
GSFC→ EROS	→ Mar '08	285	Low
ERSDAC→ EROS	FY '06 - '08	26.8	Good



Comments:

GSFC → EROS: The rating is now based on the MODAPS-PDR Server to EROS LP DAAC measurement (Results are very 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 user flow this month was about 20% lower than last month, and remains far below the nominal requirement, apparently due to the use of compression on the MODIS collection 5 data (began at the end of 2006). This performance is predominantly limited by congestion on the EBnet to Doors Gig-E circuit, as shown by the large best:worst ratio seen from the GDAAC, MODAPS, and GSFC-PTH hosts. The performance is lower than last month, due to increased loading on this GigE; and is now more than 30% below the requirement so the rating drops to "Low". It should be noted that a reduction of the requirement will be forthcoming, due primarily to the MODIS collection 5 compression.

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. From ENPL, the performance would be rated "Good".

ERSDAC → EROS: Performance was very steady this month. See section 6 (ERSDAC) for the graph and further discussion of this performance.

NSIDC → EROS: The median thruput from NSIDC-SIDADS to EROS-PTH was quite stable this month, with a higher daily worst value.

LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH was also very stable this month.

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).

2) JPL:

2.1) JPL ←→ GSFC:

Ratings: GSFC → JPL: ↓ Excellent → **Adequate**
JPL → GSFC: Continued **Excellent**

Web Pages:

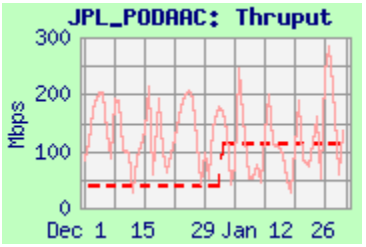
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

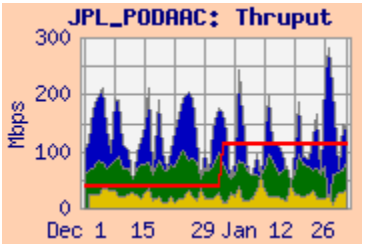
Test Results:

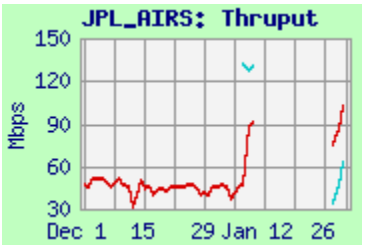
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JPL-PODAAC	238.7	111.2	24.0	21.8	116.5
GSFC-DAAC → JPL-AIRS	73.1	46.6	41.1		
GSFC-PTH → JPL-QSCAT	91.3	78.3	16.0		
GSFC-PTH → JPL-MLS	157.6	59.9	8.1		
GSFC-NISN → JPL-MISR	58.4	46.4	26.9		
GSFC-PTH → JPL-MISR	41.9	17.6	8.0		
JPL-PTH→ GSFC PTH	89.2	89.2	64.0		
JPL-PODAAC→ GSFC DAAC	16.8	16.5	16.4		

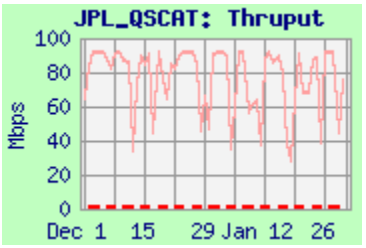
Requirements:

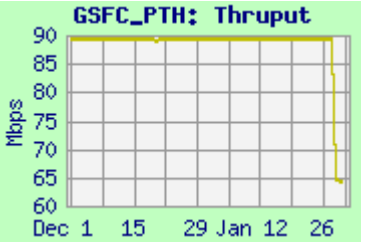
Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	Jan-May '08	113.8	**Adequate**
JPL → GSFC combined	CY '06-09	7.4	**Excellent**











Comments: **The GSFC to JPL requirement increased Jan 1 '08, from 40 mbps to 114 mbps, due to GEOS 5 flows (but which have not yet been observed).** The rating downgrade was due entirely to this requirements increase – the measured performance was very consistent.

In September '07, the NISN PIP to JPL campus connection was upgraded to a Gig-E from a Fast-E (100 mbps). This circuit is no longer a bottleneck for GSFC to JPL and LaRC to JPL flows. However, the congestion at GSFC creates large variations in performance. The user flow from GSFC/EOS was a similar to last month, not very far below the requirement without contingency.

PODAAC: Median thruput from GSFC-PTH increased with the upgrade – now over 100 mbps. The rating is based on this flow, since the AIRS node (below) did not benefit from the upgrade. Thruput increased due to reduced congestion at GSFC; the rating improves to "Excellent".

AIRS: The AIRS TLCF was upgrade to Gig-E last year, and the testing was retuned in January; thruput improved – but testing was down for most of the month due to node problems.

QSCAT: Median thruput from GSFC-PTH is now typically close to 100 mbps – limited by a Fast-E connection at QSCAT.

MISR, MLS: Testing from GSFC-PTH is affected by the GSFC congestion. See section 2.2 (below) for these graphs.

JPL → GSFC: Thruput is bimodal at either 65 or 90 mbps, like most of 2007 (thruput from JPL-PTH to LaRC-PTH was similarly bimodal). With the modest requirement, the rating remains "Excellent". The JPL → GSFC/EOS user flow is now measured – it was only 2.2 mbps this month – up from 0.7 mbps last month.

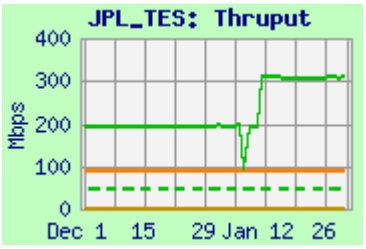
2.2) JPL ←→ LaRC

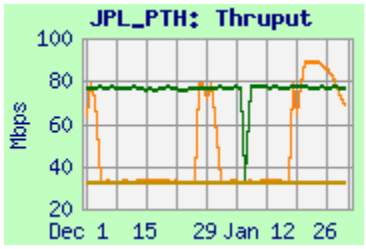
Ratings: LaRC → JPL: Continued **Excellent**
JPL → LaRC: Continued **Good**

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

Test Results:

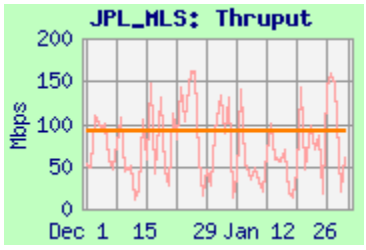
Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
LaRC DAAC → JPL-TES	308.8	307.6	228.2
LaRC PTH → JPL-TES	91.2	91.2	91.2
LaRC PTH → JPL-TES sftp	1.82	1.81	1.76
LaRC PTH → JPL-PTH sftp	32.5	32.5	32.3
LaRC PTH → JPL-MLS	91.1	91.1	91.0
LaRC DAAC → JPL-MISR	77.3	60.2	34.9
JPL-PTH → LaRC PTH	88.9	88.9	86.0

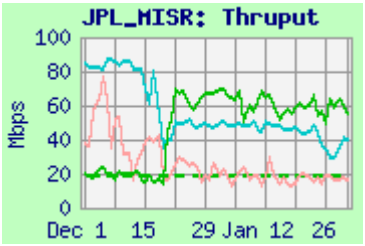




Requirements:

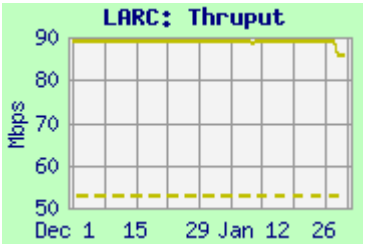
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '08	29.8	**Excellent**
LaRC DAAC → JPL-MISR	FY '07 – '08	18.5	**Excellent**
LaRC DAAC → JPL-Combined	FY '07 – '08	45.8	**Excellent**
JPL → LaRC	FY '07 – '08	52.6	**Good**





Comments: 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: Performance for most tests improved and stabilized in Sept. '07 with the NISN to JPL Ethernet upgrade, and the ratings improved. Testing from LaRC to TES was retuned in January, with improved results. Also, sftp results to TES are much lower than iperf, due to TCP window limitations, but are much better from LaRC-PTH to JPL-PTH which has been patched to increase this window size. The TES system will be upgraded in February; perhaps the window size will increase with that upgrade.



JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. Thruput was no longer bimodal (along with other JPL-PTH flows). The rating remains "Good".

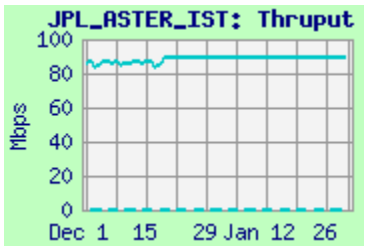
2.3) JPL ASTER IST

Rating: Continued **Excellent**

Web Page: http://ensight.eos.nasa.gov/Missions/terra/JPL_ASTER_IST.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
ERSDAC → JPL-ASTER-IST	89.9	89.7	6.0



Comments: The test from ERSDAC was initiated in March '05, via APAN. The noisy but generally steady performance must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps), and is certainly higher than the dedicated 2 mbps EBnet circuit it replaced.

3) Boulder CO:

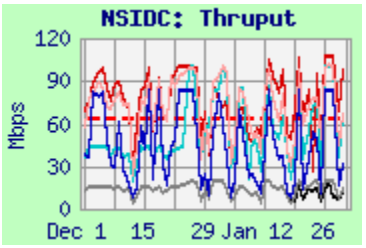
3.1) GSFC ← → NSIDC DAAC:

Ratings: NSIDC → GSFC: Continued **Excellent**
GSFC → NSIDC: ↓ Good → **Adequate**

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

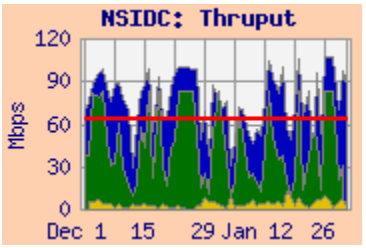
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-DAAC→ NSIDC-DAAC	106.6	72.1	18.8	4.4	72.6
GSFC-PTH → NSIDC-DAAC	101.8	77.2	14.5		
GSFC-ISIPS → NSIDC (iperf)	100.2	60.3	13.9		
GSFC-ISIPS → NSIDC (ftp)	20.0	15.0	3.2		
NSIDC DAAC → GSFC-DAAC	116.2	114.9	101.3		
NSIDC → GSFC-ISIPS (iperf)	77.9	77.5	74.9		

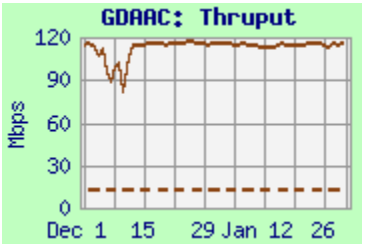


Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '08	64.1	**Adequate**
NSIDC → GSFC	CY '06 – '08	13.3	**Excellent**



Comments: GSFC → NSIDC: This rating is based on testing from GDAAC to the NSIDC DAAC. The thruput values were mostly stable this month, but show increased congestion at GSFC. The requirement varies, based on planned ICESAT reprocessing. Reprocessing **IS NOT** included in the requirements for CY '08. The Integrated thruput remains **above** this lower requirement, but by less than 30%, so the rating drops to "Adequate". Note that the integrated graph shows that the user flow remains **MUCH lower** than the requirement. This requirement is being re-evaluated.



NSIDC → GSFC: Performance from NSIDC to GSFC was mostly steady this month; with the low requirement the rating remains "Excellent". The user flow on this path is now measured – it averaged only 1 kbps this month!

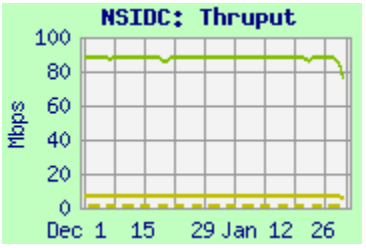
GSFC-ISIPS ← → NSIDC: Testing was retuned in December, and has been very stable since then. FTP thruput was much lower than iperf due to TCP window size limitations.

3.2) JPL → NSIDC:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
JPL PTH → NSIDC-PTH	88.3	88.2	26.4	1.34
JPL PODAAC → NSIDC	7.1	6.7	6.5	



Comments: The test from JPL-PTH to NSIDC-SIDADS more fully assesses the true network capability – the thruput is much higher than from PODAAC. Thruput from JPL-PTH had been bimodal until late November – 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 7 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".

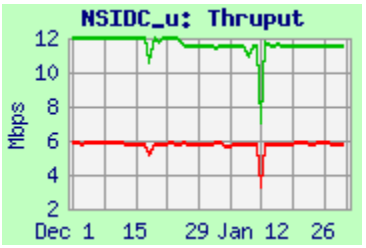
3.3) GHRC → NSIDC:

Ratings: GHRC → NSIDC: Continued **Good**

Web Pages: http://ensight.eos.nasa.gov/Missions/aqua/NSIDC_u.shtml

Test Results:

Source → Dest	Medians of daily ests (mbps)			
	Best	**Median**	**Worst**	**Req.**
GHRC → NSIDC DAAC (iperf)	12.2	11.5	3.4	7.5
GHRC → NSIDC DAAC (ftp)	5.9	5.8	3.1	



Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC. The thruput was stable this month, and the median remains more than 30 % over the requirement, so is rated "Good". The user flow averaged a typical 500 kbps this month.

3.4) LASP:

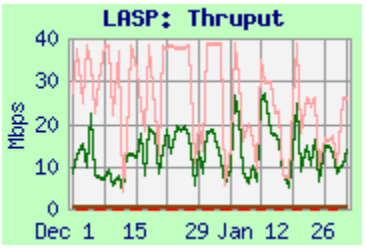
Ratings: GSFC → LASP: Continued **Excellent**

ASF → LASP: X Continued Down

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	29.1	13.3	2.9	0.4
GSFC PTH → LASP (iperf)	38.4	22.6	3.1	
GSFC PTH → LASP (sftp)	0.46	0.46	0.43	



Comments: The requirements are divided into ASF and GSFC sources:

ASF → LASP: Thruput from ASF to LASP is limited by ASF T1 circuit. However, in late September '07, the packet loss rate increased dramatically, with a corresponding drop of the typical thruput. The ASF IOnet test node stopped working in mid October, due to reconfiguration at ASF.

GSFC → LASP: GSFC → LASP iperf thruput is noisy (attributed to congestion at GSFC), but well above the requirement; the rating continues "Excellent". But sftp thruput is MUCH lower than iperf, due to window size limitations -- a patch is available. The user flow averaged 77 kbps this month, about the same as recent months.

3.5) NCAR:

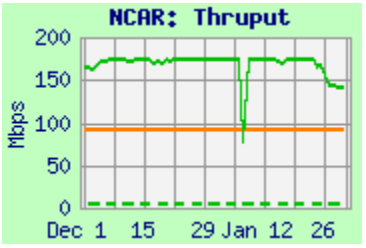
Ratings: LaRC → NCAR: Continued **Excellent**

GSFC → NCAR: Continued **Excellent**

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

Test Results:

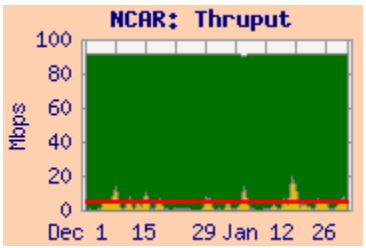
Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Requirement**
LaRC → NCAR	174.9	173.3	101.5	5.4
GSFC → NCAR	92.2	92.2	91.4	5.1



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 with retuning in December, and is well above 3 x the requirement, so the rating remains "Excellent".

From GSFC the median thruput is very steady, and also well over 3 x the requirement, so that rating also remains "Excellent". Thruput from ENPL, with a Gig-E connection to MAX, averages over 300 mbps.

The Integrated graph shows that the peak user flow from GSFC is usually consistent with the stated requirement. The average user flow this month was about 2.5 mbps (was 1.3 mbps last month).



4) GSFC ←→ LaRC:

Ratings: GSFC → LaRC: Continued **Excellent**
LDAAC → GDAAC: Continued **Excellent**

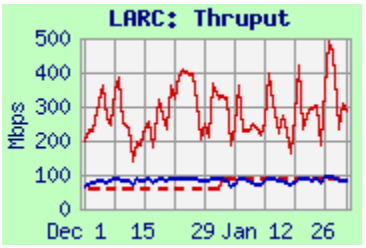
Web Pages: http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml
http://ensight.eos.nasa.gov/Organizations/production/LATIS.shtml

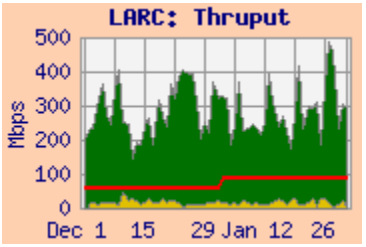
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	428.9	273.3	125.5	17.3	274.1
GSFC-PTH → LaRC-PTH	92.3	84.0	50.9		
GSFC-NISN → LaTIS	381.0	322.3	227.3		
GSFC-PTH → LaRC-ANGe	415.7	352.8	198.8		
LDAAC → GDAAC	366.6	359.1	324.1	0.4	
LARC-ANGe → GSFC-PTH	382.3	315.5	262.8		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '08	86.9	**Excellent**
LDAAC → GDAAC	FY '07 – '08	0.2	**Excellent**

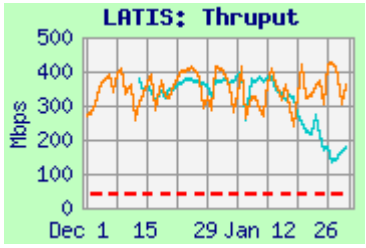




Comments:

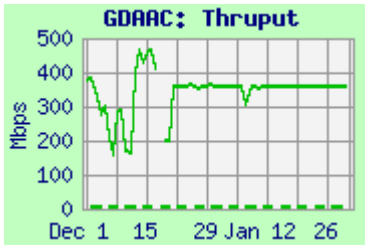
GSFC → LaRC: The requirement increased on 1 January '08 due to increased GEOS flows. The rating is based on the GDAAC to LaRC ASDC DAAC thruput, compared to the combined requirement, and continues "Excellent". Note: the lower thruput (around 90 mbps) to LaRC-PTH is limited by its 100 mbps LAN connection. The large difference between the daily best, median, and average values is attributed to congestion at GSFC.

The 17.3 mbps average user flow was a bit lower than last month's 18.2 mbps. The integrated graph shows it was fairly steady.



LaTIS: The thruput to LaTIS via PIP (from GSFC-PTH) was again mostly stable this month. Testing from GSFC-NISN stopped in September when node difficulties began, but resumed in December. Its performance was similar but with a higher worst case, since it is not subject to the EBnet congestion (until late January, when the GSFC test node developed problems).

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 decreased slightly to 400 kbps – typical for this flow



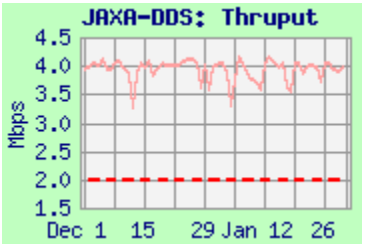
5) US ←→ JAXA:

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

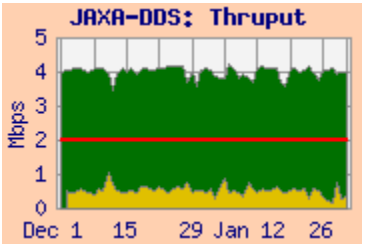
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.28	3.97	2.76	0.48	4.03
GSFC-ENPL → JAXA-azusa	75.4	71.9	44.7		
GSFC-PTH → JAXA-azusa	48.7	33.4	8.5		
GSFC-PTH → JAXA (sftp)	0.85	0.84	0.72		
JAXA-DDS → JPL-QSCAT	1.92	1.91	1.50		
JAXA-DDS → GSFC-DAAC	1.11	1.10	1.08		
JAXA-azusa→ GSFC-MAX	86.3	85.8	39.8		



Requirements:

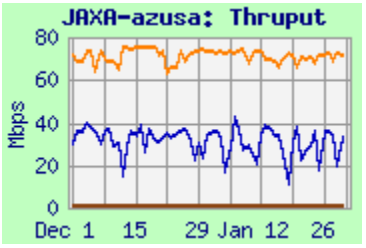
Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Mar '08	1.99	Good
JAXA → US	Nov '03 – Mar '08	1.28	Good



Comments:

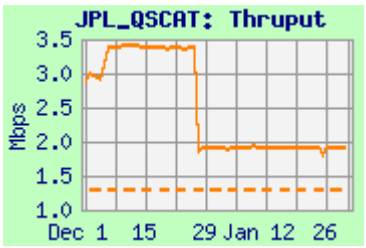
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Thruput was quite stable this month, above the requirement, but below 3 x the requirement; so the rating remains "Good".

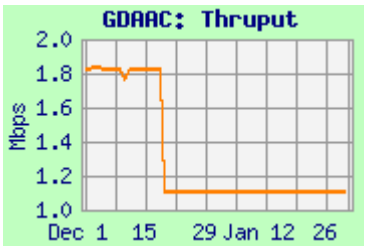
The integrated graph shows very consistent user flow, about 27% of the requirement (or 40% of the requirement without the contingency).

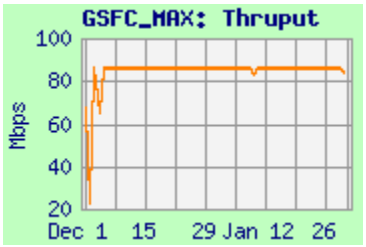


Azusa: Performance from GSFC-PTH and GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp 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. The thruput took a step function down to both destinations, in December, due to increased packet loss (fixed in February)! Thruput from JAXA to JPL was more than 30% over the requirement, but less than 3 x, so the rating remains "Good". Thruput was much higher from Azusa to GSFC, with a 100 mbps Ethernet connection, and larger TCP windows. It also had a step function in December, an improvement in this case, on yet a third date.







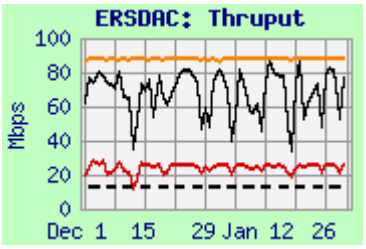
6) ERSDAC ←→ US:

Rating: 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)				
	Best	Median	Worst	User Flow	Integrated
GSFC-EDOS → ERSDAC	84.7	72.7	23.5	2.7	74.2
GDAAC → ERSDAC	26.5	25.5	12.7		
GSFC ENPL (FE) → ERSDAC	88.5	88.4	77.9		

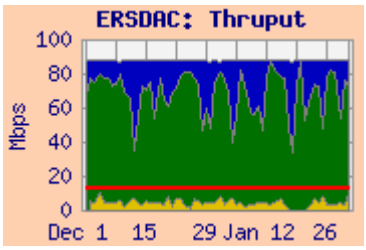


Requirements:

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

Comments: Dataflow from GSFC to ERSDAC was switched to APAN in February '05.

Testing from EDOS to ERSDAC was switched to use a FastE interface in April '07 – this test is now used as the basis for the "Excellent" rating. Peak performance is now similar to GSFC-ENPL, but the median and daily worst values are lower due to EBnet to Doors congestion. The integrated chart shows that the user flow continues to be below the requirement, by about a 3:1 factor.

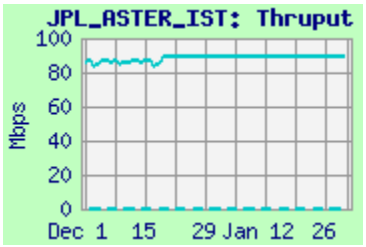


The thruput from GDAAC to ERSDAC appears to be limited by packet loss at the GigE to FastE switch at Tokyo-XP. The GigE GDAAC source does not see any bottlenecks until this switch (The Internet2 and APAN backbones are 10 Gbps), and thus exceed the capacity of the switch's FastE output circuit. But the 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.

The requirement includes the level 0 flows which used to be sent by tapes. The thruput continues to be more than 3 x this requirement, so the rating remains "Excellent".

ERSDAC → US Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ERSDAC → JPL-ASTER IST	89.9	89.7	6.0
ERSDAC → EROS	81.8	70.1	35.0

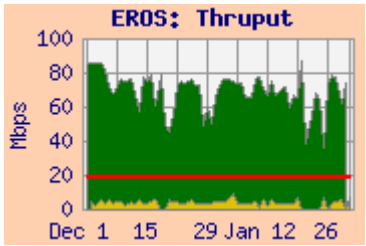


Requirements:

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

Comments:

ERSDAC → JPL-ASTER-IST: This performance must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

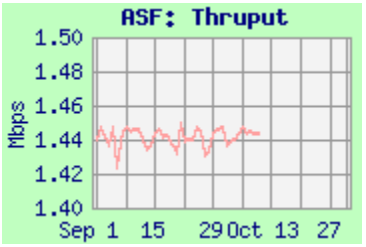


ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were again very stable this month. Thruput improved to this present values in April '05. The median thruput is a bit below 3 x the requirement, so the rating remains "Good". This user flow averaged 3.4 mbps in January, in the normal range for recent months, and well below the requirement.

7) ASF

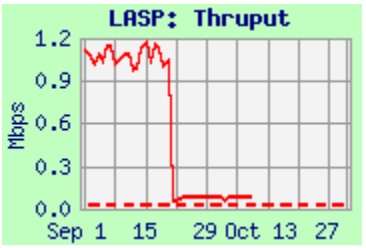
Rating: X Discontinued

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



Comments: The ASF firewall was reconfigured in October, and all IOnet testing stopped at that time. Note that the graphs on the right are from October, the last month of successful testing.

GSFC to ASF: Testing to ASF transitioned to IOnet in April '06. Performance had been very stable and consistent with the T1 (1.5 mbps) circuit capacity.



ASF to LASP: Performance had been very stable for over a year limited primarily by the ASF T1; the rating "Excellent". However, in mid September, the packet loss rate increased dramatically, with a corresponding decrease in thruput.

Requirements:

Source → Dest	Date	Kbps	Rating
ASF→ LASP	FY '07	24	**n/a**

8) Other SIPS Sites:

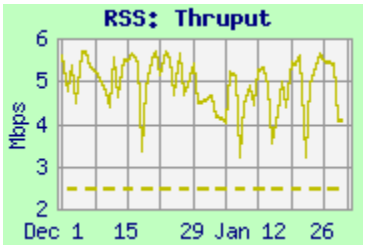
Web Pages http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

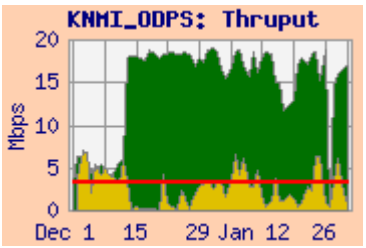
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	5.7	4.9	2.1	2.4	Continued **Good**
OMISIPS → KNMI-ODPS	18.8	16.8	10.7	3.3	Continued **Excellent**

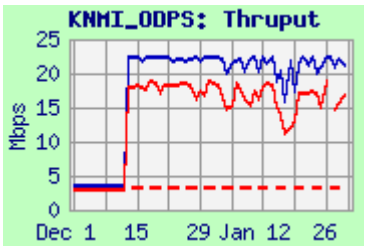
Comments:

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 is 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 Geant's 10Gbps 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. Performance dropped dramatically in mid October, but recovered in December – due to firewall reconfiguration at KNMI, which reduced the effective TCP window size. The rating drops remains "Excellent". The user flow averaged 2.7 mbps in December, comparable to recent months, as well as the requirement, as shown on the integrated graph.