EOS Production Sites
Network Performance Report

This is a monthly summary of EOS network performance testing between production sites for October 2007 -- comparing the measured performance against the requirements.

Highlights:

- **Mostly stable flows with improvement** – GPA 3.50 (Last month: 3.29)
- **Only 1 flow below "Good"**:
  - **GSFC GES DAAC to EROS** ("**Almost Adequate**")
    - Due to congestion at GSFC
    - Requirements are under review
- **Bottlenecks:**
  - GSFC: EBnet to Doors Gig-E
  - JPL: AIRS TLCF to campus LAN
- **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: ↑:

GSFC → EROS: Poor → **Almost Adequate**
GSFC → JPL: Good → **Excellent**
GSFC → NSIDC: Adequate → **Good**
GSFC → KNMI: Almost Adequate → **Excellent**

Downgrade: ↓

ERSDAC → EROS: Excellent → **Good**

Testing Down X:

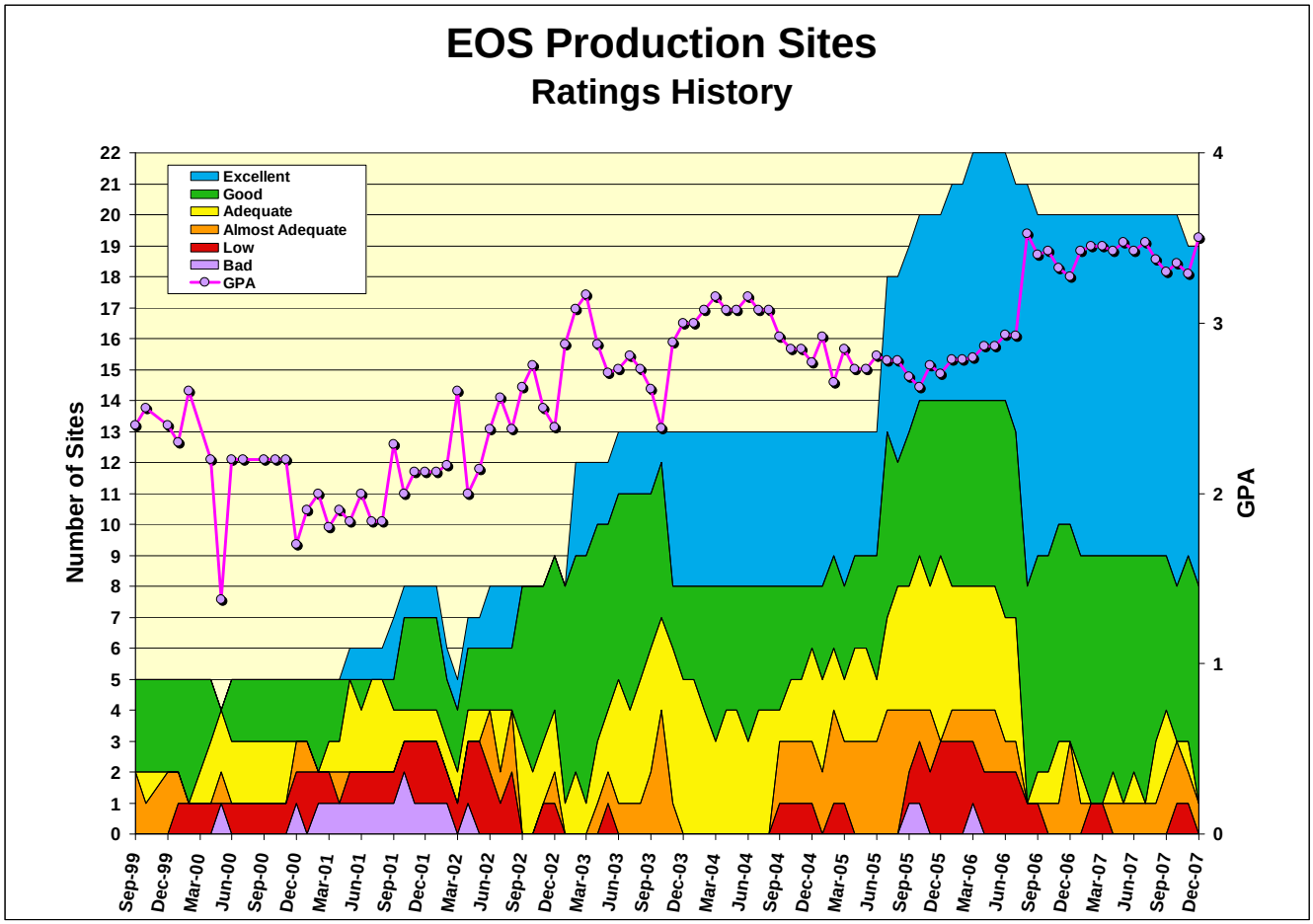
ASF → LASP, GSFC → ASF (ASF IOnet not available)

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

Ratings History:

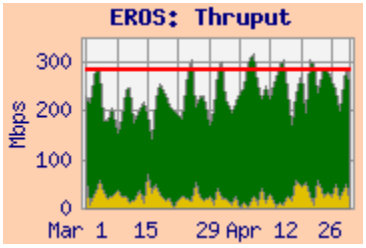


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

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

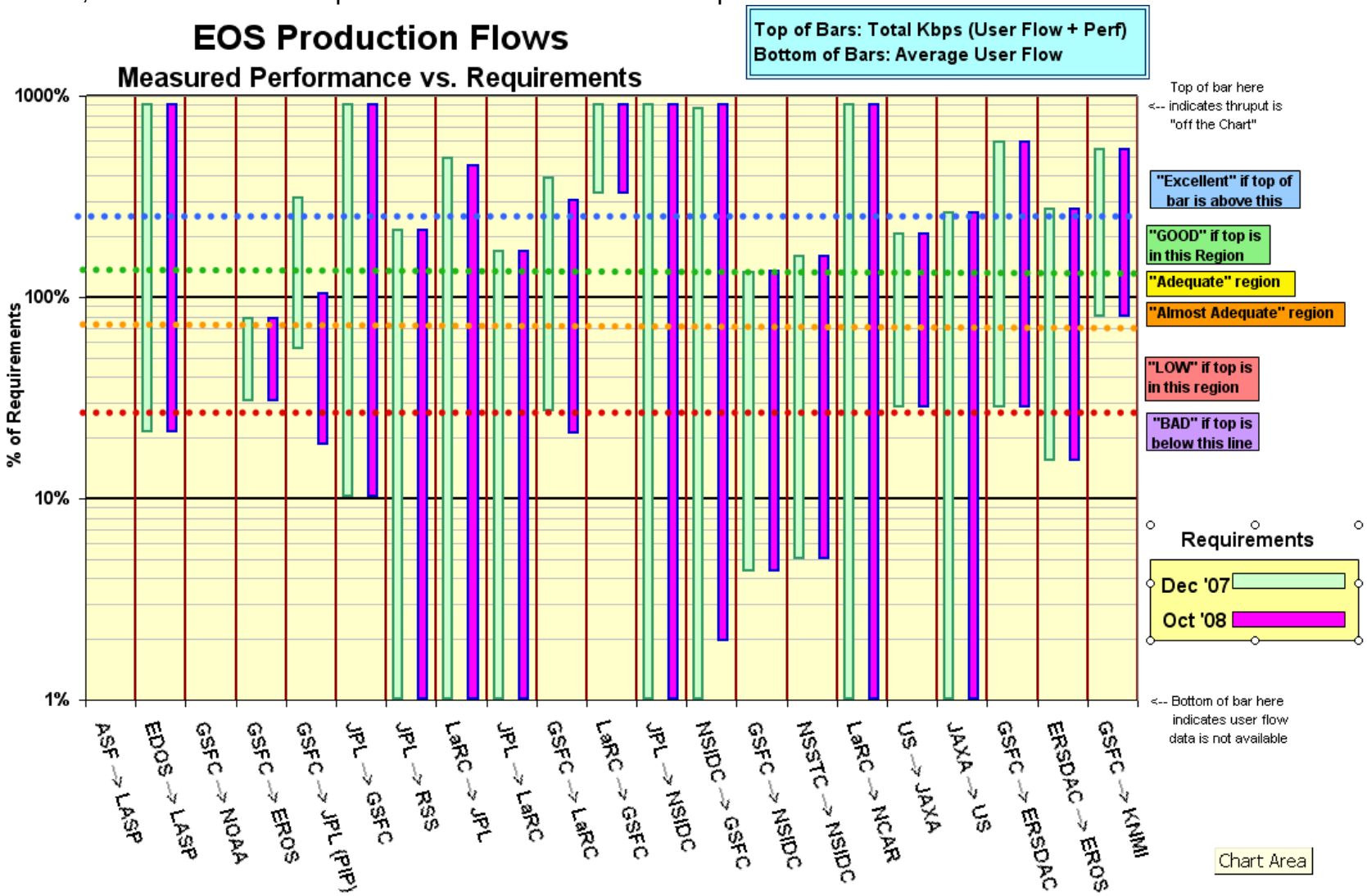
December 2007		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current	Future	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements		Rating re
		Dec-07	Oct-08					Dec-07	Last Month	Oct-08
GSFC –> ASF	QuikScat, Radarsat	n/a	n/a	GSFC-PTH → 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]	0.085	12.8		Excellent	E	Excellent
GSFC –> EROS	MODIS, LandSat	285.4	285.4	GDAAC → EROS LPDAAC	86.1	184.9	225.0	A A	L	A A
GSFC –> JPL (PIP)	AIRS, ISTs	40.5	121.0	GSFC-PTH → JPL-PODAAC	22.3	114.8	125.7	Excellent	G	Adequate
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	0.7	89.2		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		5.3		GOOD	G	GOOD
LaRC –> JPL	TES, MISR	39.6	43.2	LARC-DAAC → JPL-TES		194.8		Excellent	E	Excellent
JPL –> LaRC	TES	52.6	52.6	JPL-PTH → LARC-PTH		88.9		GOOD	G	GOOD
GSFC –> LaRC	CERES, MISR, MOPITT	67.2	86.9	GDAAC → LDAAC	18.1	253.7	264.1	Excellent	E	Excellent
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.6	359.4	359.4	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.00002	88.3		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	13.3	0.5	NSIDC DAAC → GDAAC	0.009	115.0	115.0	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	64.1	64.0	GDAAC → NSIDC-DAAC	2.8	85.4	85.7	GOOD	A	GOOD
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.4	12.0	12.0	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	0.56	4.01	4.08	GOOD	G	GOOD
JAXA –> US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		3.37		GOOD	G	GOOD
GSFC –> ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	3.5	72.6	73.2	Excellent	E	Excellent
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	4.1	72.3	73.4	GOOD	E	GOOD
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → OMI-PDR	2.6	17.3	17.8	Excellent	A A	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	Dec-07 Req Score	Dec-07 Req Prev	Oct-08 Score
Excellent	11	10	10
GOOD	7	6	7
Adequate	0	1	1
Almost Adequate	1	1	1
LOW	0	1	0
BAD	0	0	0
Total Sites	19	19	19
GPA	3.50	3.29	3.39

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 (November '07 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.

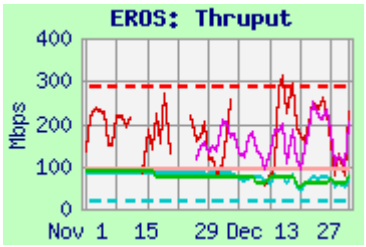
1) EROS:

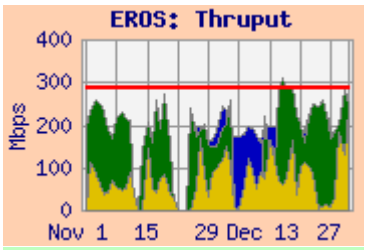
Ratings: GSFC → EROS: ↑ Poor → **Almost Adequate**
ERSDAC→ EROS: ↓ Excellent → **Good**

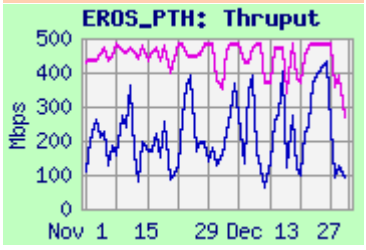
Web Page: http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-DAAC → EROS LPDAAC	297.5	184.9	88.3	86.1	225.0
MODAPS-PDR→ EROS LPDAAC	247.1	170.0	76.1	80.9	194.7
ERSDAC→ EROS LPDAAC	82.7	72.3	39.0	4.1	73.4
GSFC-PTH → EROS PTH	477.4	239.5	52.6		
GSFC-ENPL → EROS PTH	483.2	468.0	300.0		
NSIDC→ EROS	75.5	73.1	60.4		
LaRC→ EROS	93.0	93.0	55.8		
EROS LPDAAC → GSFC DAAC	223.4	151.0	94.8		
EROS PTH→ GSFC PTH	463.6	447.5	408.0		







Requirements:

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

Comments:

GSFC → EROS: The rating is based on the DAAC to DAAC measurement. 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). This month additional testing was added from the new MODAPS PDR server. After tuning, its results are about the same as from the DAAC. Since this is now the primary source of data to EROS, its performance will be used as the basis of future ratings.

The user flow this month was higher than last month, but is still 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 higher than last month, due to decreased loading on this GigE; and is now less than 30% below the requirement so the rating improves to "Almost Adequate". It also appears 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: See section 6 (ERSDAC) for the graph and discussion of this performance.

NSIDC → EROS: The median thruput from NSIDC-SIDADS to EROS-PTH declined somewhat this month, but not enough to impact any transfers.

LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH also dropped this month, similarly to NSIDC.

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

Web Pages:

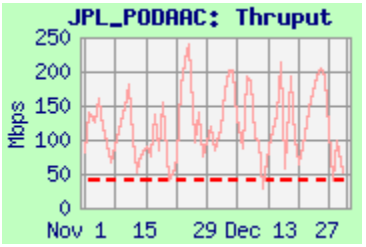
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

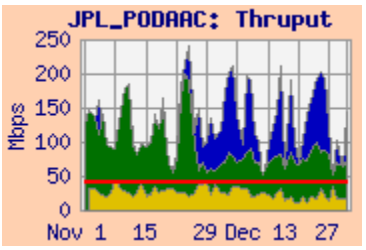
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-PTH → JPL-PODAAC	264.2	114.8	26.9	22.3	125.7
GSFC-DAAC → JPL-AIRS	48.4	45.6	25.7		
GSFC-PTH → JPL-QSCAT	91.3	85.8	21.7		
GSFC-PTH → JPL-MLS	156.9	59.3	8.6		
GSFC-NISN → JPL-MISR	87.8	69.5	40.2		
GSFC-PTH → JPL-MISR	83.2	31.2	10.7		
JPL-PTH→ GSFC PTH	89.2	89.2	64.4		
JPL-PODAAC→ GSFC DAAC	36.5	27.9	16.5		

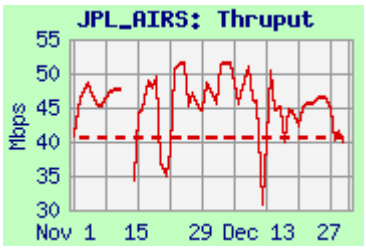
Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	April-Dec '07	40.5	**Excellent**
JPL → GSFC combined	CY '06-09	7.4	**Excellent**



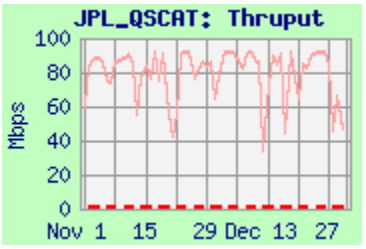


Comments: In September '07, the NISN PIP to JPL campus connection was upgraded to a Gig-E from a Fast-E (100 mbps). This circuit is no longer a bottleneck for GSFC to JPL and LaRC to JPL flows. Improvements were noted on most flows. However, the congestion at GSFC created large variations in performance, although somewhat lower than last month. The user flow from GSFC/EOS was a bit lower as last month, not very far below the requirement without contingency.



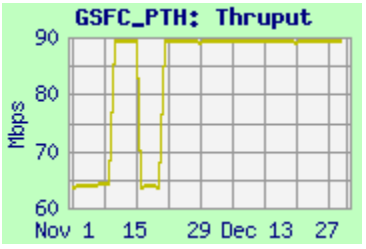
PODAAC: Median thruput from GSFC-PTH increased with the upgrade – now over 100 mbps. The rating is based on this flow, since the AIRS node (below) did not benefit from the upgrade. Thruput increased due to reduced congestion at GSFC; the rating improves to "Excellent".

AIRS: The AIRS TLCF is still limited by a Fast-E connection to the JPL campus LAN (expected to be upgraded soon). However; thruput from GDAAC did improve and stabilize somewhat after the upgrade.



QSCAT: Median thruput from GSFC-PTH increased with the upgrade – now closer to 100 mbps – limited by a Fast-E connection at QSCAT.

MISR, MLS: Testing from GSFC-PTH to MISR and MLS also increased with the upgrade, but is also affected by the GSFC congestion. Testing from "GSFC-NISN" to JPL-MISR is not subject to the EBnet congestion at GSFC, and had slightly higher peaks, but much higher median (2:1) and daily worst (4:1) values than from GSFC-PTH. See section 2.2 (below) for these graphs.

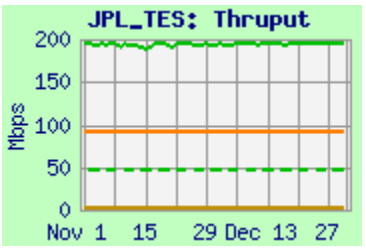


JPL → GSFC: The previous JPL-PODAAC to GSFC-DAAC testing was replaced by JPL-PTH to GSFC-PTH testing to better reflect the network capabilities. Thruput had been bimodal at either 65 or 90 mbps for most of 2007 (thruput from JPL-PTH to LaRC-PTH was similarly bimodal), but that cleared up in Late November. With the modest requirement, the rating remains "Excellent". The JPL → GSFC/EOS user flow is now measured – it was only 0.7 mbps this month – down from 1.4 mbps last month.

2.2) JPL ←→ LaRC

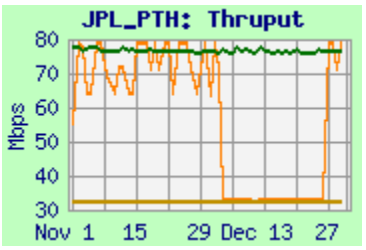
Ratings: LaRC → JPL: Continued **Excellent**
JPL → LaRC: Continued **Good**

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



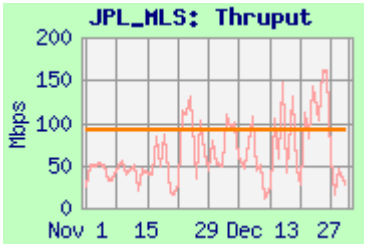
Test Results:

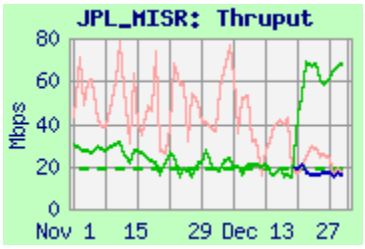
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC DAAC → JPL-TES	195.3	194.8	189.0
LaRC PTH → JPL-TES	91.2	91.2	91.2
LaRC PTH → JPL-TES sftp	1.82	1.81	1.78
LaRC PTH → JPL-PTH sftp	32.5	32.5	32.4
LaRC PTH → JPL-MLS	91.1	91.1	91.0
LaRC DAAC → JPL-MISR	58.1	20.7	12.1
JPL-PTH → LaRC PTH	88.9	88.9	87.1



Requirements:

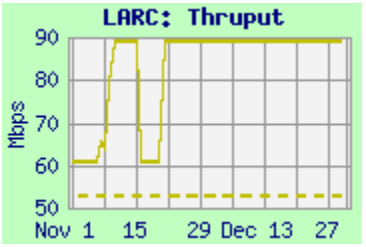
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '08	29.8	**Excellent**
LaRC DAAC → JPL-MISR	FY '07 – '08	18.5	**Excellent**
LaRC DAAC → JPL-Combined	FY '07 – '08	45.8	**Excellent**
JPL → LaRC	FY '07 – '08	52.6	**Good**





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 on Sept. 15 with the NISN to JPL Ethernet upgrade, and the ratings improved. Testing from LaRC to MISR was retuned in mid December, 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.

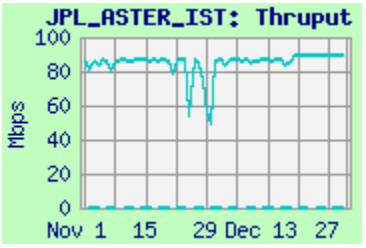


JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. Thruput was no longer bimodal (along with other JPL-PTH flows), although thruput from LaRC-PTH to JPL-PTH dropped for most of December. The rating remains "Good".

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	89.1	87.1	5.1

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: ↑ Adequate → **Good**

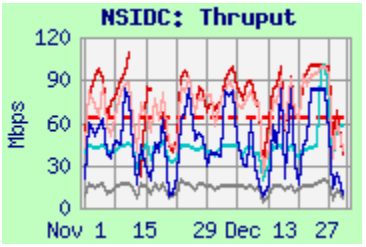
Web Page: http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml

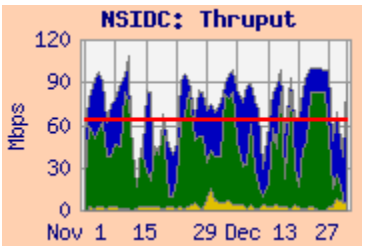
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-DAAC→ NSIDC-DAAC	99.9	85.4	19.9	2.8	85.7
GSFC-PTH → NSIDC-DAAC	102.3	76.9	19.0		
GSFC-ISIPS → NSIDC (iperf)	44.2	42.9	16.9		
GSFC-ISIPS → NSIDC (ftp)	20.3	15.5	3.5		
NSIDC DAAC → GSFC-DAAC	115.9	115.0	91.3		
NSIDC → GSFC-ISIPS (iperf)	78.5	78.1	76.5		

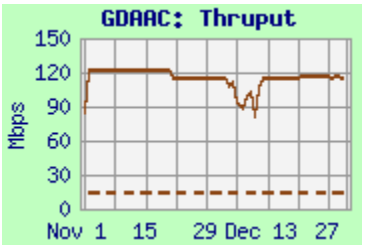
Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '08	64.1	**Good**
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 slightly higher this month, due to decreased congestion at GSFC. The requirement varies, based on planned ICESAT reprocessing. Reprocessing **IS NOT** included in the requirements for CY '07. The Integrated thruput is now **above** this lower requirement by slightly more than 30%, so the rating improves to "Good". 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 9 kbps this month!

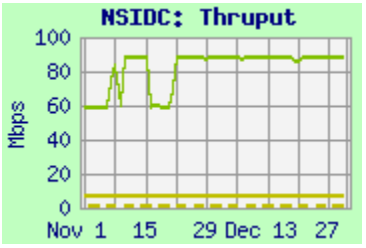
GSFC-ISIPS ← → NSIDC: Performance between ISIPS and NSIDC was at nominal levels for the circuit capacity until it dropped in Mid-July, due to host switch (was retuned in December) . FTP thruput was much lower than iperf due to TCP window size limitations.

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	88.3	27.4	1.34
JPL PODAAC → NSIDC	7.1	6.7	6.5	

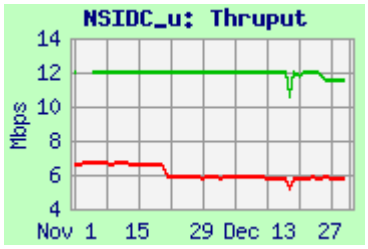


Comments: The test from JPL-PTH to NSIDC-SIDADS more fully assesses the true network capability – the thruput is much higher than from PODAAC. Thruput from JPL-PTH had been bimodal until late November – much like the JPL-PTH to GSFC and LaRC results. Thruput from PODAAC to NSIDC-SIDADS was much lower but stable. User flow is now measured on this path: only about 1 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)	12.4	12.0	6.4	7.5
GHRC → NSIDC DAAC (ftp)	5.9	5.8	5.2	

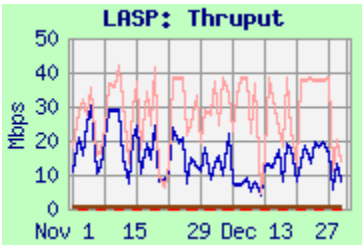
Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC. The thruput was stable this month, and the median remains more than 30 % over the requirement, so is rated "Good". The user flow averaged 370 kbps this month (was typically 500-600 kbps previously).

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	24.5	12.8	2.7	0.4
GSFC PTH → LASP (iperf)	38.4	33.8	3.8	
GSFC PTH → LASP (sftp)	0.46	0.46	0.44	

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, 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.

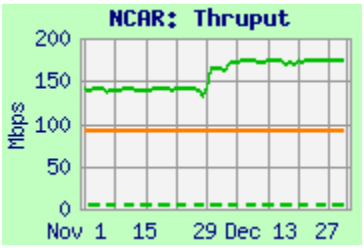
GSFC → LASP: GSFC → LASP iperf thruput is noisy (attributed to congestion at GSFC), but well above the requirement; the rating continues "Excellent". But sftp thruput is MUCH lower than iperf, due to window size limitations -- a patch is available. The user flow averaged 86 kbps this month, about the same as recent months.

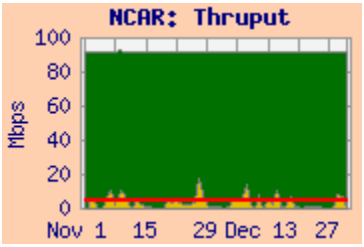
3.5) NCAR:

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	174.6	173.3	121.9	5.4
GSFC → NCAR	92.2	92.2	91.7	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 1.3 mbps (was 2.0 mbps last month).

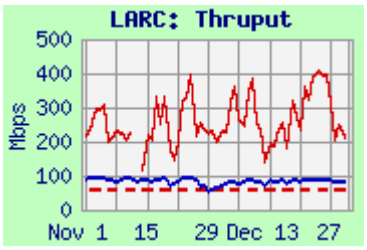
4) GSFC ←→ LaRC:

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

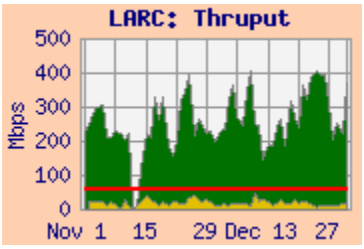
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	423.1	253.7	135.6	18.1	264.1
GSFC-PTH → LaRC-PTH	92.2	85.0	56.1		
GSFC-NISN → LaTIS	394.1	359.5	269.5		
GSFC-PTH → LaRC-ANGe	416.2	360.7	231.9		
LDAAC → GDAAC	391.1	359.4	245.9	0.6	
LARC-ANGe → GSFC-PTH	365.1	311.2	267.6		



Requirements:

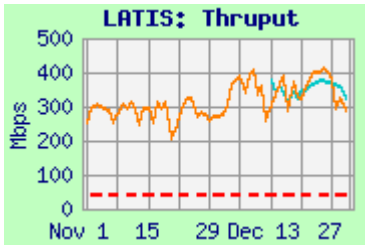
Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	Nov '06 – Dec '07	67.2	**Excellent**
LDAAC → GDAAC	FY '07 – '08	0.2	**Excellent**



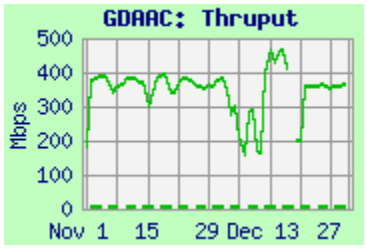
Comments:

GSFC → LaRC: The "Excellent" rating is based on the GDAAC to LaRC ASDC DAAC thruput, compared to the combined requirement. 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 (which was a little lower this month than last month).

The 18.1 mbps average user flow was a bit lower than last month's 21.6 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 is similar but with a higher worst case, since it is not subject to the EBnet congestion.



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 increased slightly to 600 kbps – typical for this flow

5) US ←→ JAXA:

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

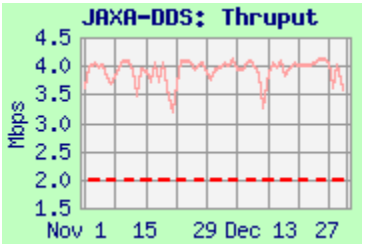
Web Pages http://ensight.eos.nasa.gov/Organizations/production/JAXA_EOC.shtml
http://ensight.eos.nasa.gov/Organizations/production/JAXA_HEOC.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml

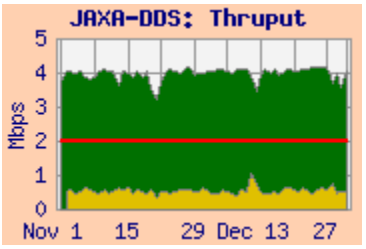
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.29	4.01	2.86	0.56	4.08
GSFC-ENPL → JAXA-azusa	75.5	73.4	29.3		
GSFC-PTH → JAXA-azusa	50.7	34.1	10.4		
GSFC-PTH → JAXA (sftp)	0.85	0.84	0.76		
JAXA-DDS → JPL-QSCAT	3.43	3.37	1.80		
JAXA-DDS → GSFC-DAAC	1.84	1.82	1.10		
JAXA-azusa→ GSFC-MAX	86.3	86.0	37.8		

Requirements:

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

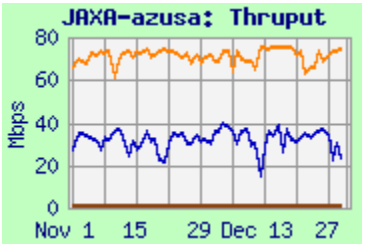




Comments:

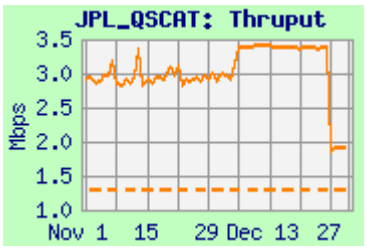
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Thruput was quite stable this month, above the requirement, but below 3 x the requirement; so the rating remains "Good".

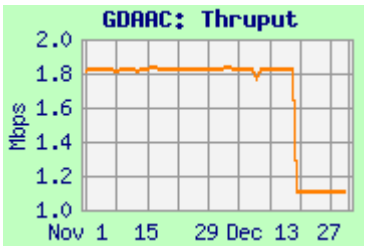
The integrated graph shows very consistent user flow, about 27% of the requirement (or 40% of the requirement without the contingency).

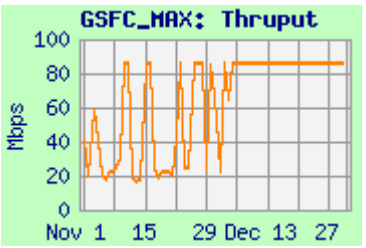


Azusa: Performance from GSFC-PTH and GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp 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, BUT AT DIFFERENT DATES! 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 als had a step function, an improvement in this case, on yet a third date. The bimodal thruput characteristics has disappeared.







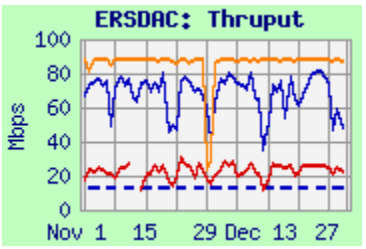
6) ERSDAC ←→ US:

Rating: GSFC → ERSDAC: Continued **Excellent**
ERSDAC → EROS: ↓ Excellent → **Good**

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

US → ERSDAC Test Results

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-EDOS → ERSDAC	84.2	72.6	26.4	3.5	73.2
GDAAC → ERSDAC	27.0	25.2	12.0		
GSFC ENPL (FE) → ERSDAC	88.5	88.2	76.2		

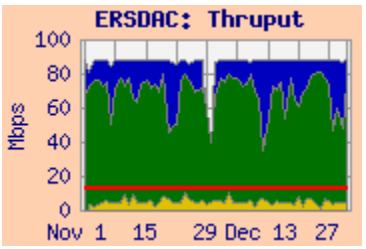


Requirements:

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.



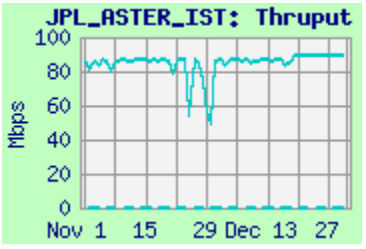
The integrated chart shows that the user flow continues to be below the requirement, by about a 3:1 factor.

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	89.1	87.1	5.1
ERSDAC → EROS	82.7	72.3	39.0

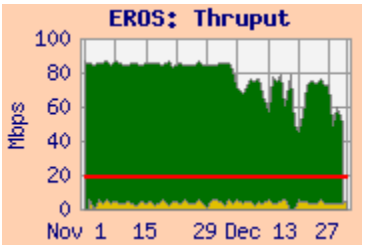


Requirements:

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).

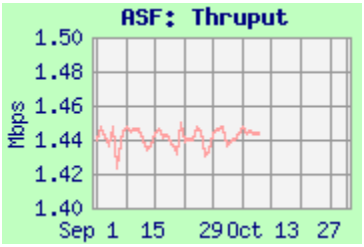


ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were again very stable this month. Thruput improved to this present values in April '05. The median thruput is more than 3 x the requirement, so the rating remains "Excellent". This user flow averaged 4.1 mbps in December, typical for recent months, and well below the requirement.

7) ASF

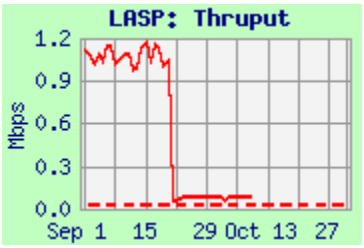
Rating: X Discontinued

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**

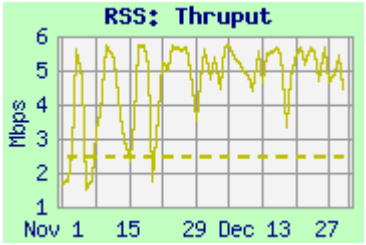
8) Other SIPS Sites:

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

Test Results:

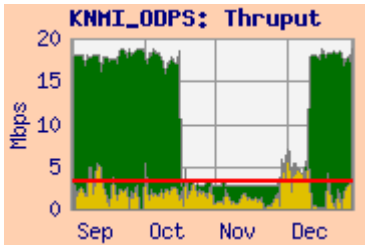
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	5.7	5.3	2.3	2.4	Continued **Good**
OMISIPS → KNMI-ODPS	18.8	17.3	10.4	3.3	↑Almost Adequate → **Excellent**

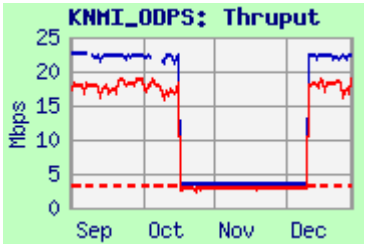
Comments:



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 was noisy but less so than last month. 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 Frankfurt, then Surfnet via 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 recovers to "Excellent" " The user flow averaged 2.6 mbps in December, comparable to recent months, as well as the requirement, as shown on the integrated graph.