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** – GPA 3.29 (Last month: 3.35)
- **2 flows below "Adequate"**:
  - **GSFC GES DAAC to EROS** ("**Low**")
    - Due to congestion at GSFC
    - Requirements are under review
  - **GSFC to KNMI**: **Almost Adequate** (fixed in December)
- **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: ↑:

JPL → RSS: Almost Adequate → **Good**
GSFC → NSIDC: Almost Adequate → **Adequate**

Downgrade: ↓ :

GSFC → KNMI: Excellent → **Almost Adequate**

Testing Discontinued X:

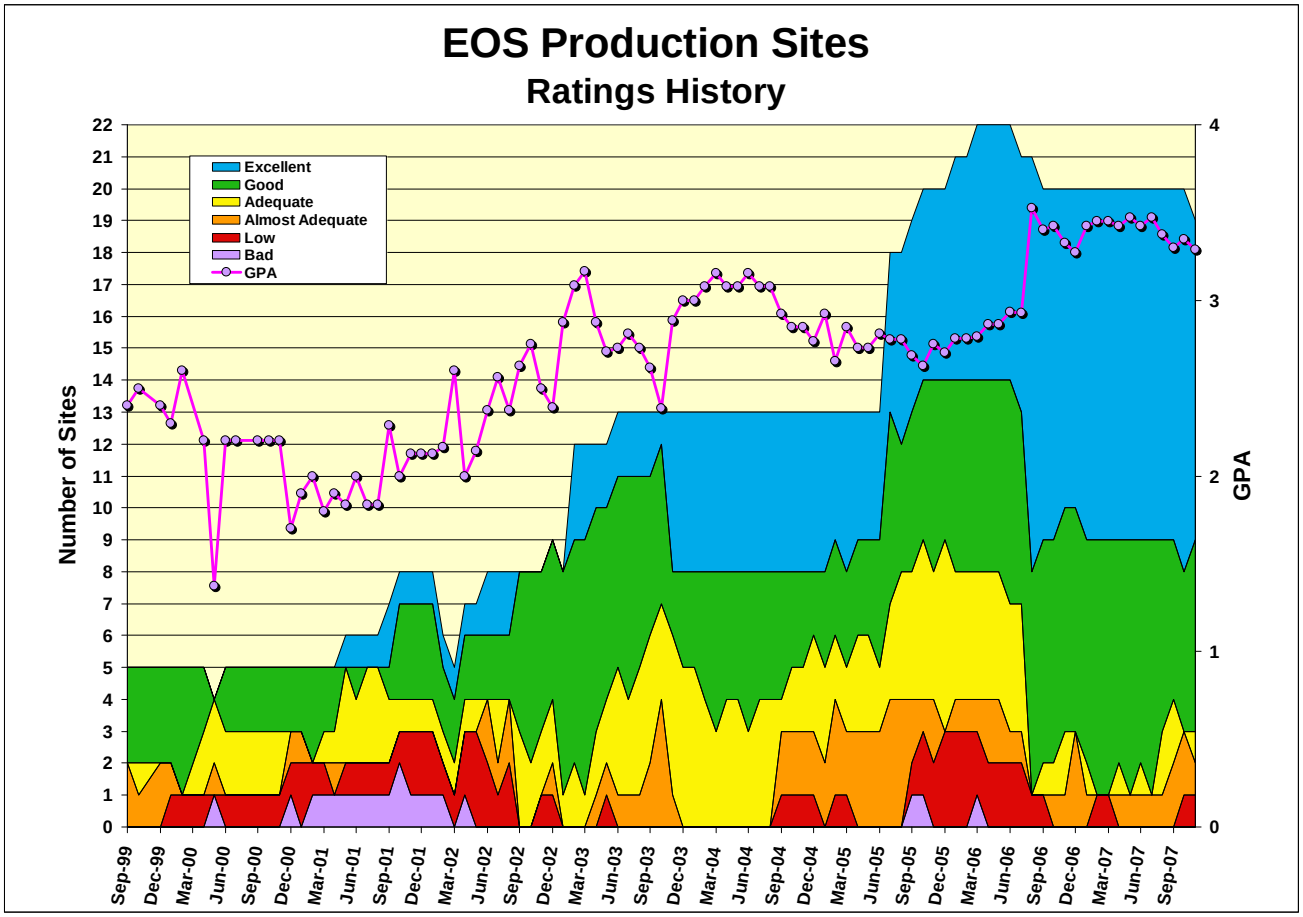
ASF → LASP (ASF IOnet not available)

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:

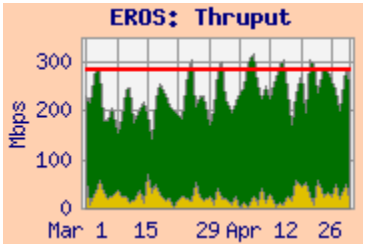


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

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

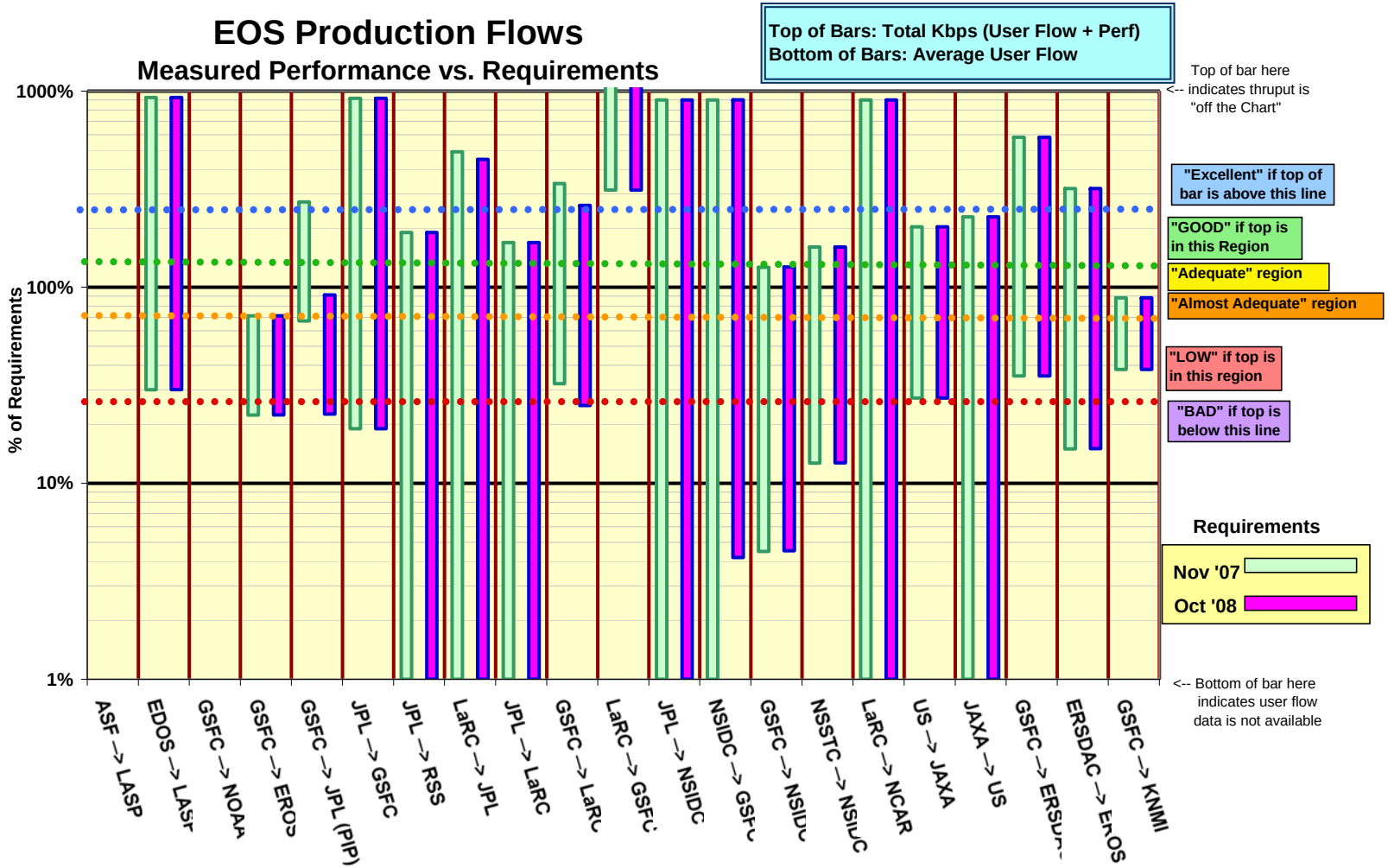
November 2007		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current Nov-07	Future Oct-08	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements Nov-07	Last Month	Rating re Oct-08
GSFC –> ASF	QuikScat, Radarsat	n/a	n/a	GSFC-PTH → ASF				n/a	n/a	n/a
ASF –> LASP	QuikScat	0.02	0.02	ASF → LASP [via IOnet]				n/a	E	n/a
EDOS –> LASP	ICESat, QuikScat	0.4	0.4	EDOS --> LASP [via IOnet]	0.1	17.3		Excellent	E	Excellent
GSFC –> EROS	MODIS, LandSat	285.4	285.4	GDAAC → EROS LPDAAC	63.6	188.7	204.0	LOW	L	LOW
GSFC –> JPL (PIP)	AIRS, ISTs	40.5	121.0	GSFC-PTH → JPL-PODAAC	27.2	100.2	110.4	GOOD	G	A A
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	1.4	89.1		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		4.7		GOOD	A A	GOOD
LaRC –> JPL	TES, MISR	39.6	43.2	LARC-DAAC → JPL-TES		194.0		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	21.6	226.0	227.1	Excellent	E	GOOD
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.6	370.3	370.4	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.00	85.7		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	13.3	0.5	NSIDC DAAC → GDAAC	0.02	121.1	121.1	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	64.1	64.0	GDAAC → NSIDC-DAAC	2.9	80.4	81.1	Adequate	A A	Adequate
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	1.0	12.0	12.0	GOOD	G	GOOD
LaRC –> NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		140.4		Excellent	E	Excellent
US –> JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.5	3.9	4.0	GOOD	G	GOOD
JAXA –> US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		2.9		GOOD	G	GOOD
GSFC –> ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	4.4	71.7	72.5	Excellent	E	Excellent
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	4.0	85.2	85.5	Excellent	E	Excellent
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → OMI-PDR	1.3	2.9	2.9	A A	E	A A

*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	Nov-07 Req Score	Prev	Oct-08 Score
Excellent	10	12	9
GOOD	6	5	6
Adequate	1	0	1
Almost Adequate	1	2	2
LOW	1	1	1
BAD	0	0	0
Total Sites	19	20	19
GPA	3.29	3.35	3.16

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.

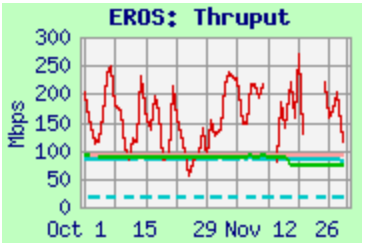
1) EROS:

Ratings: GSFC → EROS: Continued **Low**
ERSDAC→ EROS: Continued **Excellent**

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

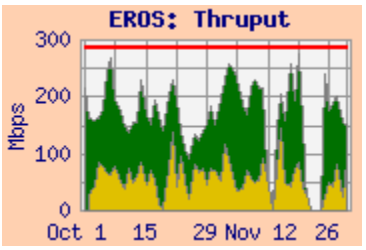
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-DAAC → EROS LPDAAC	297.5	188.7	72.2	63.6	204.0
ERSDAC→ EROS	88.4	85.2	68.3	4.0	
GSFC-PTH → EROS PTH	424.2	188.7	60.8		
GSFC-ENPL → EROS PTH	483.0	454.5	321.9		
NSIDC→ EROS	89.8	88.5	73.6		
LaRC→ EROS	92.9	92.9	92.1		
EROS LPDAAC → GSFC DAAC	144.8	138.4	122.8		
EROS PTH→ GSFC PTH	461.0	433.7	391.8		



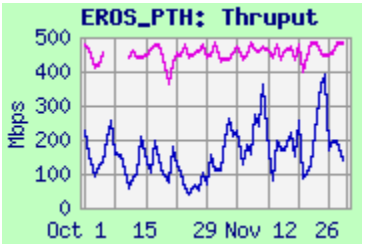
Requirements:

Source → Dest	Date	mbps	Rating
GSFC→ EROS	→ Mar '08	285	**Low**
ERSDAC→ EROS	FY '06, '07	26.8	**Excellent**



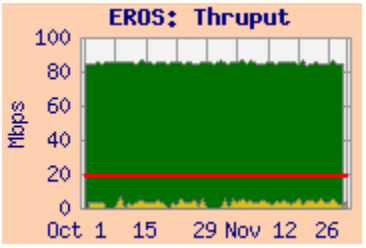
Comments:

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).



The user flow this month was a bit higher than last month, but is far below the nominal requirement, apparently due to the use of compression on the MODIS collection 5 data (began at the end of 2006). The user flow had a small contribution to the integrated measurement on which the rating is based. 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 and GSFC-PTH hosts. The performance is higher than last month, due to decreased loading on this GigE; but is still more than 30% below the requirementm so the rating remains "Low". However, it 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: The median thruput from ERSDAC to EROS (in support of the ASTER flow) remained stable on the APAN / Internet2 route (limited by the ERSDAC 100 mbps tail circuit), and averages more than 3 times the 26.8 mbps requirement, resulting in an "Excellent" rating. User flow averaged 4.0 mbps this month -- this is also considerably below the requirement.

NSIDC → EROS: The median thruput from NSIDC-SIDADS to EROS-PTH has been stable for the last 4 months.

LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH has been very stable for all of 2007.

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

Web Pages:

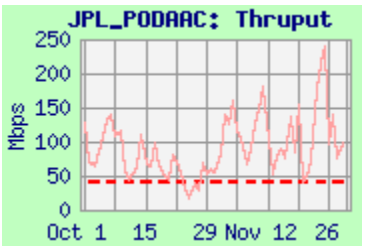
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

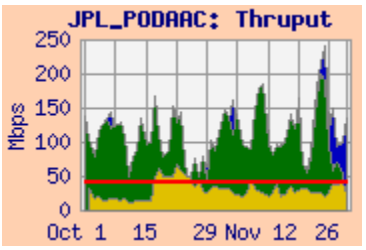
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JPL-PODAAC	221.5	100.2	27.5	27.2	110.4
GSFC-DAAC → JPL-AIRS	51.0	46.7	27.6		
GSFC-PTH → JPL-QSCAT	91.3	84.5	25.0		
GSFC-PTH → JPL-MLS	94.4	47.0	9.4		
GSFC-NISN → JPL-MISR	84.5	76.9	43.7		
GSFC-PTH → JPL-MISR	85.6	47.1	13.2		
JPL-PTH→ GSFC PTH	89.2	89.1	63.4		
JPL-PODAAC→ GSFC DAAC	39.4	38.8	36.9		

Requirements:

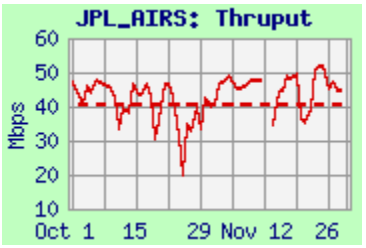
Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	April-Dec '07	40.5	**Good**
JPL → GSFC combined	CY '06-09	7.4	**Excellent**





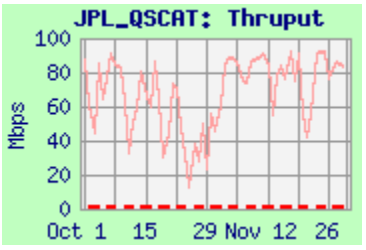
Comments: On September 15, the NISN PIP to JPL campus connection was upgraded to a Gig-E from a Fast-E (100 mbps). This circuit is no longer a bottleneck for GSFC to JPL and LaRC to JPL flows. Improvements were noted on most flows. However, the congestion at GSFC created large variations in performance, but somewhat lower than last month. The user flow from GSFC/EOS remained about the same as last month, very close to 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 remains "Good".



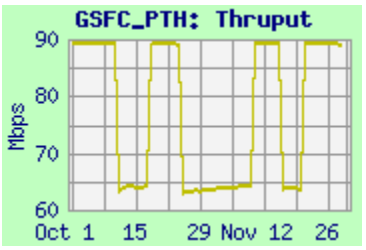
AIRS: The AIRS TLCF is still limited by a Fast-E connection to the JPL campus LAN (expected to be upgraded soon). However; thruput from GDAAC did improve and stabilize somewhat after the upgrade.

QSCAT: Median thruput from GSFC-PTH increased with the upgrade – now closer to 100 mbps.



MISR, MLS: Testing from GSFC-PTH to MISR and MLS also increased with the upgrade, but is affected by the GSFC congestion. Testing from "GSFC-NISN" to JPL-MISR was added in November. It is not subject to the EBnet congestion at GSFC, and had much steadier performance. See section 2.2 (below) for these graphs.

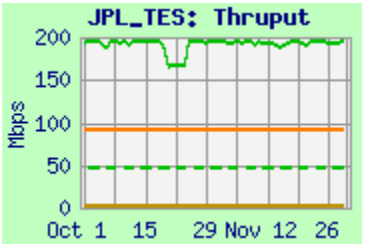
JPL → GSFC: The previous JPL-PODAAC to GSFC-DAAC testing was replaced by JPL-PTH to GSFC-PTH testing to better reflect the network capabilities. Thruput has been bimodal at either 65 or 90 mbps for most of 2007 (thruput from JPL-PTH to LaRC-PTH is similarly bimodal). With the modest requirement, the rating remains "Excellent". The JPL → GSFC/EOS user flow is now measured – it was only 1.4 mbps this month – down from 1.8 mbps in October.



2.2) JPL ←→ LaRC

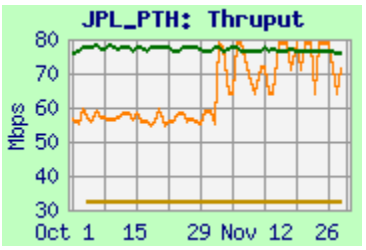
Ratings: LaRC → JPL: Continued **Excellent**
JPL → LaRC: Continued **Good**

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



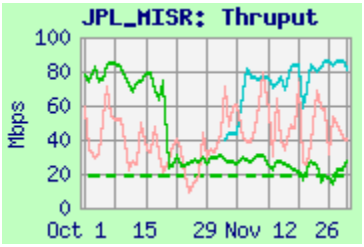
Test Results:

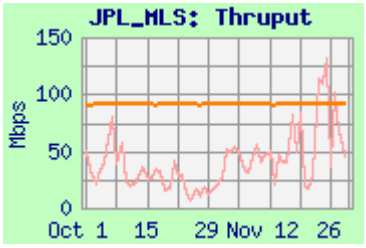
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC DAAC → JPL-TES	195.2	194.0	179.7
LaRC PTH → JPL-TES	91.2	91.2	91.2
LaRC PTH → JPL-TES sftp	1.82	1.81	1.78
LaRC PTH → JPL-PTH sftp	32.5	32.5	32.4
LaRC PTH → JPL-MLS	91.1	91.0	90.6
LaRC DAAC → JPL-MISR	44.8	26.1	13.9
JPL-PTH → LaRC PTH	88.9	88.9	60.8



Requirements:

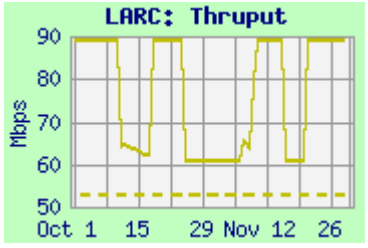
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '08	29.8	**Excellent**
LaRC DAAC → JPL-MISR	FY '07 – '08	18.5	**Excellent**
LaRC DAAC → JPL-Combined	FY '07 – '08	45.8	**Excellent**
JPL → LaRC	FY '07 – '08	52.6	**Good**





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 rating improved. However, testing from LaRC to MISR seems to have a problem with pasket loss, beginning in late October (under investigation). 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.

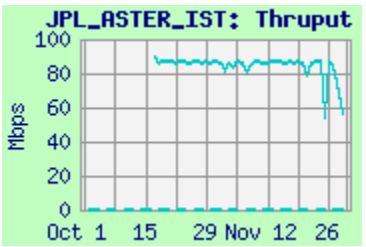


JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. Thruput was again bimodal (along with other JPL-PTH flows). The rating remains "Good".

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	88.6	86.2	7.5

Comments: The test from ERSDAC was initiated in March '05, via APAN replacing the EBnet circuit. The IST node was moved in late July – testing stopped at that time, but resumed in October The performance must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

3) Boulder CO:

3.1) GSFC ← → NSIDC DAAC:

Ratings: NSIDC → GSFC: Continued **Excellent**
GSFC → NSIDC: ↑ Almost Adequate → **Adequate**

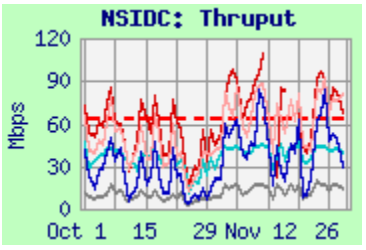
Web Page: http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml

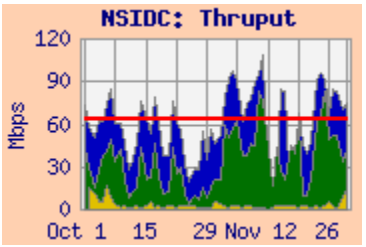
Test Results:

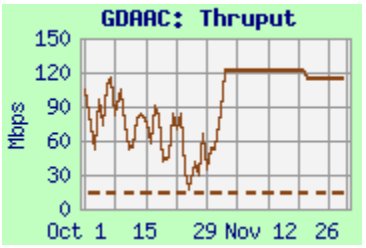
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-DAAC→ NSIDC-DAAC	101.1	80.4	28.2	2.9	81.1
GSFC-PTH → NSIDC-DAAC	97.6	72.4	17.1		
GSFC-ISIPS → NSIDC (iperf)	46.2	41.8	17.8		
GSFC-ISIPS → NSIDC (ftp)	20.3	14.8	3.5		
NSIDC DAAC → GSFC-DAAC	122.1	121.1	106.7		
NSIDC → GSFC-ISIPS (iperf)	86.6	86.0	77.7		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '08	64.1	**Almost 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 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 but by **less** than 30%, so the rating improves 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 also improved with the decreased congestion at GSFC; with the low requirement the rating remains "Excellent". The user flow on this path is now measured – it averaged only 22 kbps again this month!

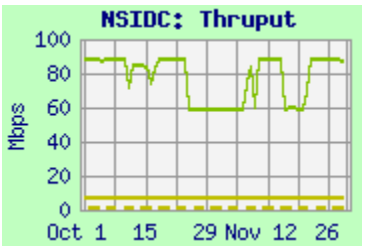
GSFC-ISIPS ← → NSIDC: Performance between ISIPS and NSIDC was at nominal levels for the circuit capacity until it dropped in Mid-July, due to host switch (was retuned in December) . FTP thruput was much lower than iperf due to TCP window size limitations.

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	85.7	26.2	1.34
JPL PODAAC → NSIDC	7.7	7.2	6.7	1.34



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 dropped on Aug 11 – then improved back to the previous value in late September – 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 2 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".

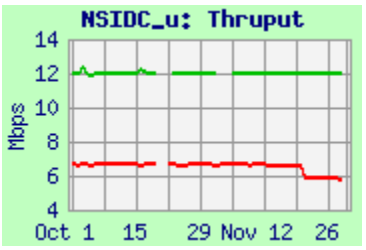
3.3) GHRC → NSIDC:

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)	12.5	12.0	4.3	7.5
GHRC → NSIDC DAAC (ftp)	6.7	6.6	3.4	



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 950 kbps this month (was typically 500-600 kbps previously).

3.4) LASP:

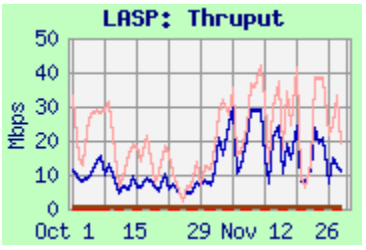
Ratings: GSFC → LASP: Continued **Excellent**

ASF → LASP: X Discontinued

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	40.5	17.3	3.6	0.4
GSFC PTH → LASP (iperf)	41.9	28.9	4.0	
GSFC PTH → LASP (sftp)	0.50	0.50	0.46	



Comments: The requirements are divided into ASF and GSFC sources: Performance continues noisy from GSFC.

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, which was lower this month), 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 115 kbps this month, higher that the 83 mbps last month.

3.5) NCAR:

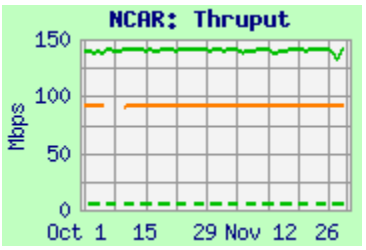
Ratings: LaRC → NCAR: Continued **Excellent**

GSFC → NCAR: Continued **Excellent**

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

Test Results:

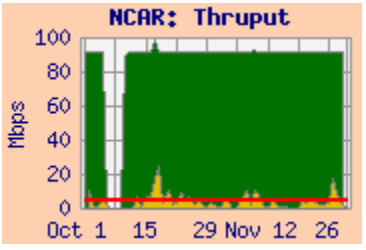
Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Requirement**
LaRC → NCAR	141.7	140.4	101.9	5.4
GSFC → NCAR	92.2	92.2	91.0	5.1



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 stabilized in July, and is well above 3 x the requirement, so the rating remains "Excellent".

From GSFC the median thruput is 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 usually consistent with the stated requirement. The average user flow for October was about 2.0 mbps (was 2.6 mbps last month).



4) GSFC ←→ LaRC:

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

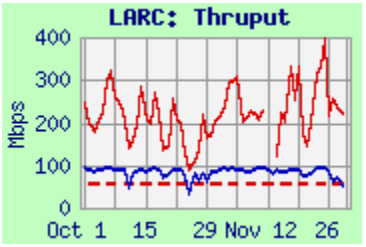
Web Pages: http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml
http://ensight.eos.nasa.gov/Organizations/production/LATIS.shtml

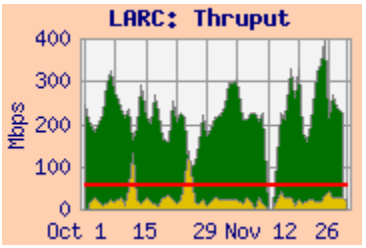
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	363.9	226.0	111.0	21.6	227.1
GSFC-PTH → LaRC-PTH	93.3	88.5	43.8		
GSFC-PTH → LaRC-ANGe	323.8	291.4	174.7		
LDAAC → GDAAC	398.7	370.3	279.0	0.6	
LARC-ANGe → GSFC-PTH	350.8	341.5	291.7		

Requirements:

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

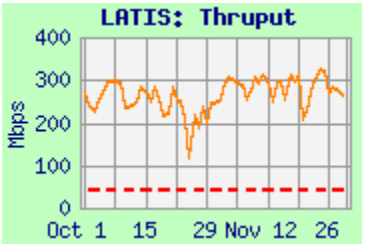




Comments:

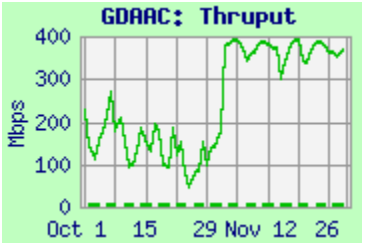
GSFC → LaRC: The "Excellent" rating is based on the GDAAC to LaRC ECS DAAC thruput, compared to the combined requirement. Note: the lower thruput (around 90 mbps) to LaRC-PTH is limited by its 100 mbps LAN connection. The large difference between the daily best, median, and average values is attributed to congestion at GSFC (which was a little lower this month than last month).

The average user flow was a bit lower than last month's 30 mbps. The integrated graph shows it was mostly steady (Last month there were a few short (but large volume) bursts (from MODIS)).



LaTIS: The thruput to LaTIS via PIP (from GSFC-PTH) was mostly stable this month. Testing from GSFC-NISN stopped in September when node difficulties began, but resumed in December, with similar performance.

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 – it was only 500 kbps in October (and 800 kbps in September).



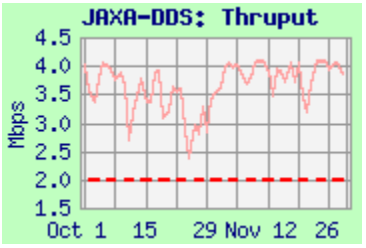
5) US ←→ JAXA:

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

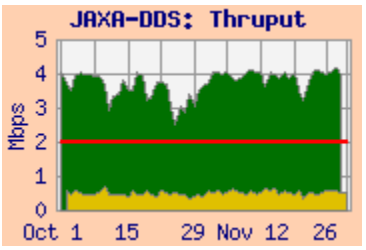
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.14	3.94	2.70	0.54	4.04
GSFC-ENPL → JAXA-azusa	75.5	71.9	39.2		
GSFC-PTH → JAXA-azusa	49.8	31.8	11.8		
GSFC-PTH → JAXA (sftp)	0.85	0.84	0.76		
JAXA-DDS → JPL-QSCAT	3.41	2.93	1.73		
JAXA-DDS → GSFC-DAAC	1.84	1.82	1.72		
JAXA-azusa→ GSFC-MAX	86.2	25.0	11.8		



Requirements:

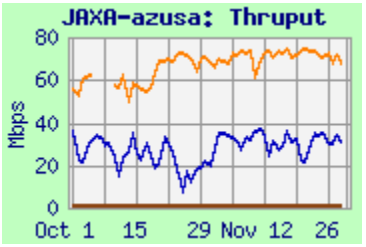
Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Mar '08	1.99	Good
JAXA → US	Nov '03 – Mar '08	1.28	Good



Comments:

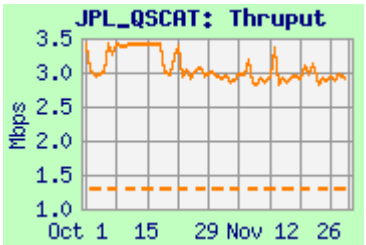
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Thruput was mostly stable this month, above the requirement, but below 3 x the requirement; so the rating remains "Good".

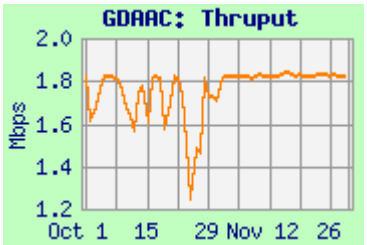
The integrated graph shows very consistent user flow, about 27% of the requirement (or 40% of the requirement without the contingency).

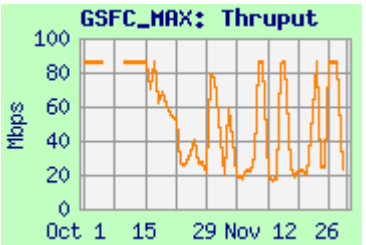


Azusa: Performance from GSFC-PTH and GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp 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 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. However, thruput characteristics appear bimodal, but no routing changes are observed.







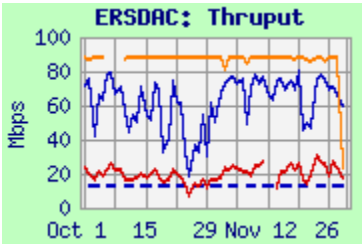
6) ERSDAC ←→ US:

Rating: Continued **Excellent**

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	83.6	71.7	21.9	4.4	72.5
GDAAC → ERSDAC	31.9	22.3	9.4		
GSFC ENPL (FE) → ERSDAC	88.5	88.4	73.8		

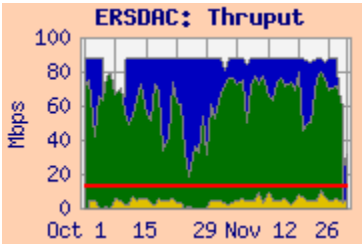


Requirements:

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, and the performance above is via that route.

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.



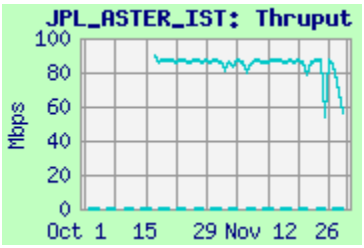
The integrated chart shows that the user flow continues to be below the requirement, by about a 3:1 factor.

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	88.6	86.2	7.5
ERSDAC → EROS	88.4	85.2	68.3



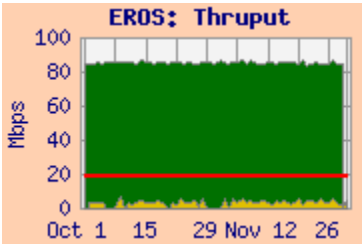
Requirements:

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

Comments:

ERSDAC → JPL-ASTER-IST: This test was initiated in March '05, via APAN replacing the EBnet circuit. Testing stopped when the JPL ASTER IST node was moved in late July, then resumed in mid October -- at similar performance to the previous 83 mbps. This must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

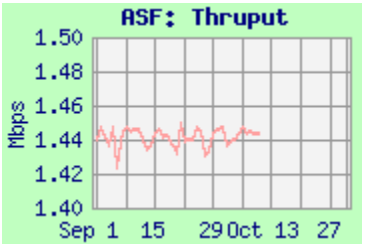
ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were again very stable this month. Thruput improved to this present values in April '05. The median thruput is more than 3 x the requirement, so the rating remains "Excellent". This user flow averaged 4.0 mbps in November, well below the requirement.



7) ASF

Rating: X Discontinued

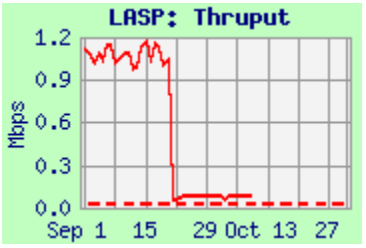
Web Page: http://ensight.eos.nasa.gov/Organizations/production/ASF.shtml



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

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**

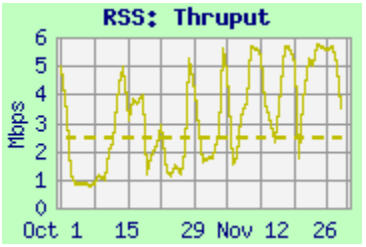
8) Other SIPS Sites:

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

Test Results:

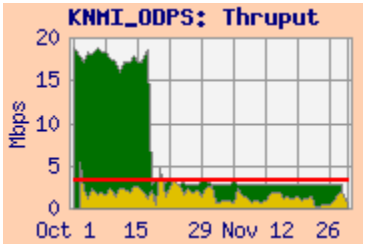
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	5.7	4.7	1.8	2.4	↑ Almost Adequate → **Good**
OMISIPS → KNMI-ODPS	2.9	2.9	2.7	3.3	↓ Excellent → **Almost Adequate**

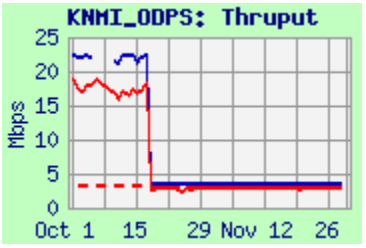
Comments:



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) (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 now above the requirement, by more than 30%, so the rating improves to "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 to "Almost Adequate". The user flow averaged 1.2 mbps in November, compared with 2.2 mbps in September and October, as shown on the integrated graph.