EOS Production Sites
Network Performance Report

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

Highlights:

- **Mostly stable flows with continued (increasing) congestion at GSFC**
  - GPA 3.47 (Last month: 3.26)
- **Only 1 flow below "Adequate"**
  - **GSFC MODAPS-PDR to EROS** ("**Low**")
    - Due to EBnet to Doors congestion at GSFC
    - Requirement has been reviewed
      - The requirement **INCREASED** (285 → 346 mbps)
      - Due to increased MODIS reprocessing
- **Bottlenecks:**
  - GSFC: EBnet to Doors Gig-E
- **Requirements Update:** new values based on review are now used in selected cases – details below. **Most performance upgrades are due primarily to reduced GEOS requirements.**
- Significant changes in testing are indicated in Blue, Problems in Red

Ratings Changes: (See site discussion below for details)

Upgrades: ↑:

GSFC → JPL: Adequate → **Good**
GSFC → LaRC: Good → **Excellent**
JPL → LaRC: Good → **Excellent**
JAXA → US: Adequate → **Good**

Downgrades: ↓: None

Testing Down X:

ASF → LASP, GSFC → ASF (ASF IOnet node is still not available)

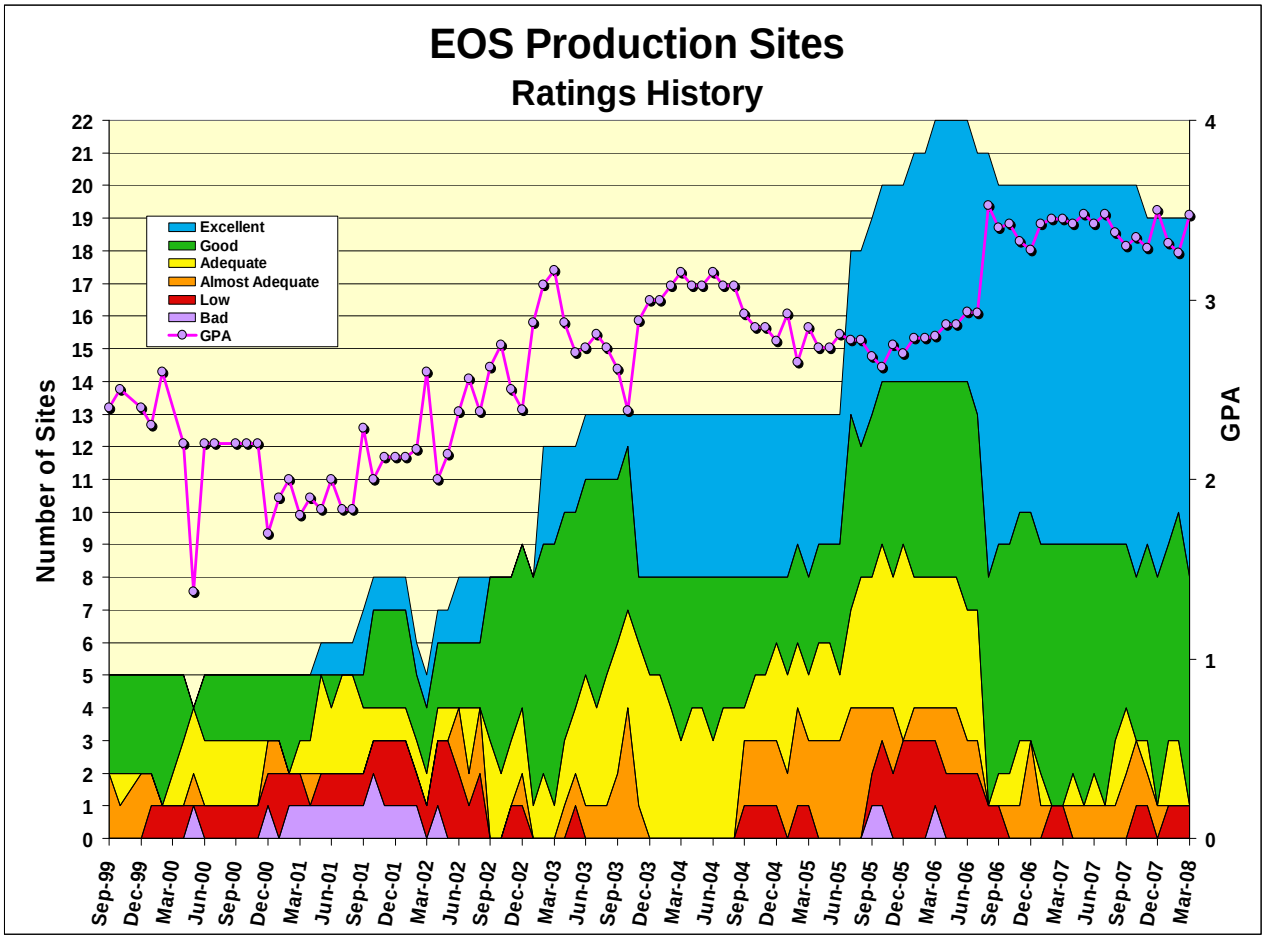
Testing Added: ✓

WSC → ASF (for ALOS)

Ratings Categories:

Rating	Value	Criteria
Excellent:	**4**	**Total Kbps** > Requirement * 3
Good:	**3**	1.3 * Requirement <= **Total Kbps** < Requirement * 3
Adequate:	**2**	Requirement < **Total Kbps** < Requirement * 1.3
Almost Adequate:	**1.5**	Requirement / 1.3 < **Total Kbps** < Requirement
Low:	**1**	Requirement / 3 < **Total Kbps** < Requirement / 1.3
Bad:	**0**	**Total Kbps** < Requirement / 3

Where Total Kbps = Integrated Kbps (where available), otherwise just iperf

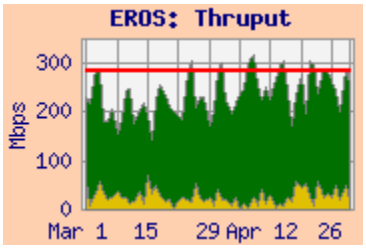


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

Requirements Basis:

- April '08 Revisions
  - Reduced GEOS Flows
  - Increased MODIS reprocessing
- December '03 requirements from BAH.
  - Updated to handbook 1.4.1 (3/22/06)
- Additional Updates Incorporated:
  - New AIRS reprocessing flows (8/06)
  - GEOS requirements – Flows began in Nov '06
  - All LaRC-GSFC "Backhaul" Requirements removed
  - Extension of TRMM, QuikScat missions

Integrated Charts:



Integrated charts are included with site details, where available. These charts are "Area" charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (e.g., EROS, in this example) obtained from routers via "netflow". The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.

Network Requirements vs. Measured Performance

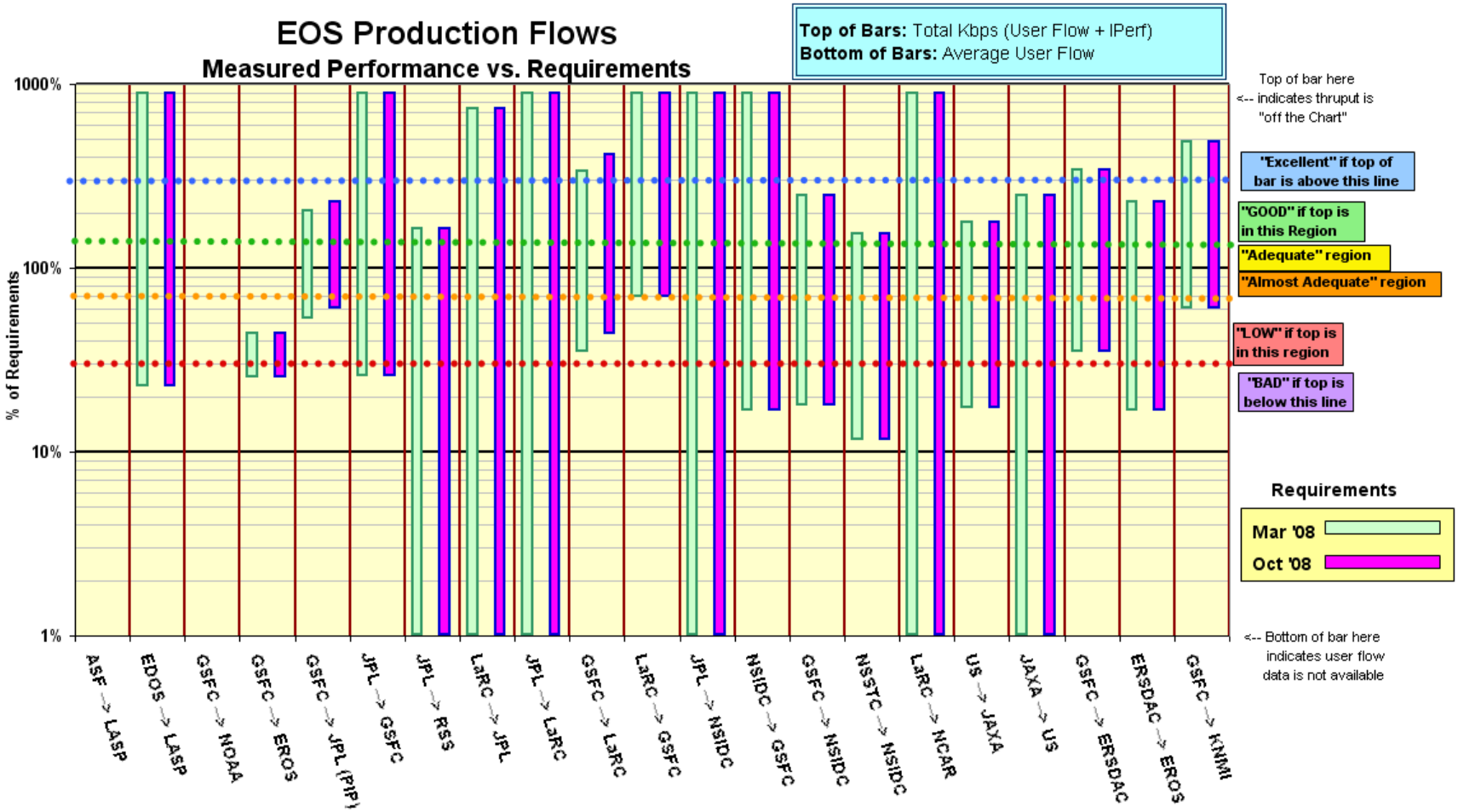
March 2008		Requirements (mbps)		Testing			Ratings			
Source → Destination	Team (s)	Current Mar-08	Future Oct-08	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements Mar-08	Rating re Current Requirements Last Month	Rating re Oct-08
WSC –> ASF	ALOS	n/a	n/a	WSC → ASF		1.7		n/a	n/a	n/a
ASF –> LASP	QuikScat	0.02	0.02	ASF → LASP [via IOnet]				n/a	n/a	n/a
EDOS –> LASP	ICESat, QuikScat	0.4	0.4	EDOS --> LASP [via IOnet]	0.09	5.9		Excellent	E	Excellent
GSFC –> EROS	MODIS, LandSat	345.9	345.9	MODAPS-PDR → EROS LPDAAC	87.8	96.5	153.1	LOW	L	LOW
GSFC –> JPL (PIP)	AIRS, MLS, ISTs	46.1	43.6	GSFC-PTH → JPL-AIRS	23.2	81.8	89.6	GOOD	A	GOOD
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	1.9	66.6		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		4.1		GOOD	G	GOOD
LaRC –> JPL	TES, MISR	43.2	43.2	LARC-DAAC → JPL-TES		320.5		Excellent	E	Excellent
JPL –> LaRC	TES	4.4	4.4	JPL-PTH → LARC-PTH		87.5		Excellent	G	Excellent
GSFC –> LaRC	CERES, MISR, MOPITT	60.5	48.7	GDAAC → LDAAC	21.2	201.4	203.4	Excellent	G	Excellent
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	2.2	359.3	359.3	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.002	84.4		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	0.5	0.5	NSIDC DAAC → GDAAC	0.08	114.9	114.9	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	34.5	34.5	MODAPS-PDR → NSIDC-DAAC	6.1	84.7	85.9	GOOD	G	GOOD
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.9	11.5	11.5	GOOD	G	GOOD
LaRC –> NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		165.3		Excellent	E	Excellent
US –> JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.34	3.45	3.53	GOOD	G	GOOD
JAXA –> US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		3.20		GOOD	A	GOOD
GSFC –> ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	4.3	41.0	42.5	Excellent	E	Excellent
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	4.5	58.8	61.6	GOOD	G	GOOD
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → OMI-PDR	2.0	15.5	15.9	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	Mar-08 Req Score	Mar-08 Req Prev	Oct-08 Req Score
Excellent	11	9	11
GOOD	7	7	7
Adequate	0	2	0
Almost Adequate	0	0	0
LOW	1	1	1
BAD	0	0	0
Total Sites	19	19	19
GPA	3.47	3.26	3.47

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

This graph shows two bars for each source-destination pair. Each bar uses the same actual measured performance, but compares it to the requirements for two different times (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 generally include a 50% contingency factor above what was specified by the projects, so a value of 66% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar represents the integrated measurement, ombining the user flow with Iperf measurements – this value is used to determine the ratings.

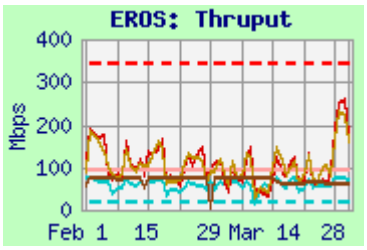
1) EROS:

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

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

Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
MODAPS-PDR→ EROS LPDAAC	188.2	96.5	30.8	87.8	151.3
GSFC-DAAC → EROS LPDAAC	219.5	79.9	37.6		
ERSDAC→ EROS LPDAAC	80.1	58.8	21.2	4.5	61.6
GSFC-EBnet-PTH → EROS PTH	284.7	81.0	34.6		
GSFC-ENPL → EROS PTH	482.0	402.4	283.6		
NSIDC→ EROS	71.9	64.7	60.4		
LaRC→ EROS	93.0	93.0	92.9		



Requirements:

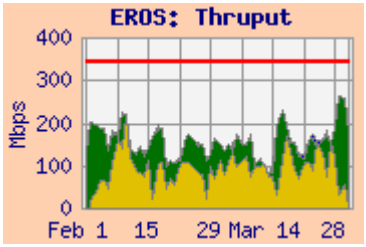
Source → Dest	Date	mbps	Rating
GSFC→ EROS	CY '08-11	346	Low
ERSDAC→ EROS	FY '06 - '08	26.8	Good

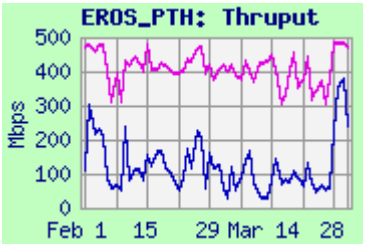
Comments:

GSFC → EROS: The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement (Results are similar to GES DAAC). The route is via NISN SIP, on the NISN OC-48 (2.5 gbps) backbone, to the NISN Chicago CIEF, then via GigE to StarLight, peering with the EROS OC-12 (622 mbps).

The requirement was increased this month (was 285 mbps previously), to allow additional MODIS reprocessing, which was partially mitigated by the compression used in MODIS collection 5. The user flow this month was about 10% higher than last month, but remains far below the nominal requirement.

The performance is predominantly limited by congestion on the EBnet to Doors Gig-E circuit at GSFC, as shown by the large best:worst ratio seen from the GDAAC, MODAPS, and GSFC-PTH hosts. The performance is about the same as month, and remains more than 30% below the requirement so the rating remains "Low".





The GSFC-ENPL host has a direct connection to the MAX, bypassing the congested EBnet to Doors Gig-E circuit, and using the previous Internet2 route. It does not experience similar congestion to the DAAC. Performance from ENPL is much higher, and 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

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

2) to GSFC

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

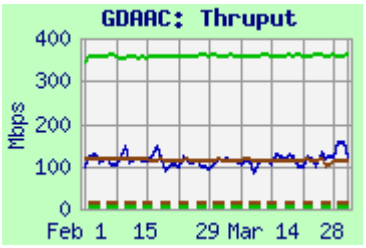
Web Pages:
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

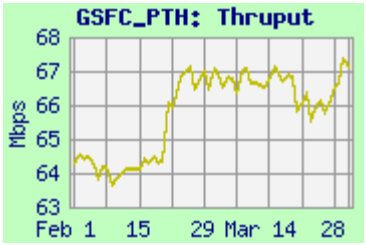
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
EROS LPDAAC → GSFC DAAC	151.3	115.7	84.3		
EROS PTH→ GSFC PTH	460.6	432.0	372.1		
JPL-PTH→ GSFC PTH	67.2	66.6	65.9		
LDAAC → GDAAC	367.5	359.3	322.1	2.2	359.3
LARC-ANGe → GSFC-PTH	392.7	350.9	271.2		
NSIDC DAAC → GSFC-DAAC	115.6	114.9	93.2	.08	
NSIDC → GSFC-ECHO (ftp)	5.6	5.5	4.8		

Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '08	13.3	**Excellent**
LDAAC → GDAAC	FY '07 – '08	0.2	**Excellent**
JPL→ GSFC combined	CY '06-09	7.4	**Excellent**





EROS → GSFC: The thruput for tests from EROS to GSFC (both DAAC to DAAC and PTH to PTH) were mostly stable this month, but note that the DAAC to DAAC flow cannot use most of the WAN capability (compared to the EROS-PTH to GSFC-PTH results).

JPL → GSFC: Thruput was stable at 65 mbps this month (but has been bimodal at either 65 or 90 mbps, since 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 was only 2.0 mbps this month – up from 0.7 mbps last month.

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 to 2.2 mbps.

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 again averaged under 100 kbps this month!

3) JPL:

3.1) GSFC → JPL:

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

Web Pages:

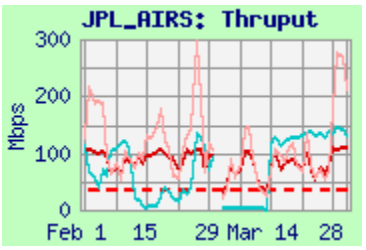
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

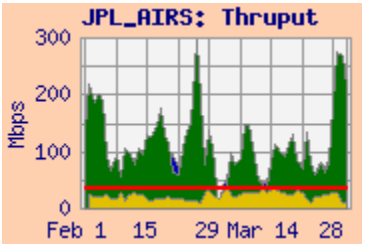
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-PTH → JPL-AIRS	232.7	81.8	34.9	23.2	82.1
GSFC-DAAC→ JPL-AIRS	115.8	75.5	39.5		
GSFC-PTH → JPL-PODAAC	200.3	48.4	17.9		
GSFC-PTH → JPL-QSCAT	90.4	35.1	11.8		
GSFC-PTH → JPL-MLS	101.6	17.1	5.8		
GSFC-NISN → JPL-MLS	108.5	92.3	75.3		
GSFC-PTH → JPL-QSCAT	90.4	35.1	11.8		

Requirements:

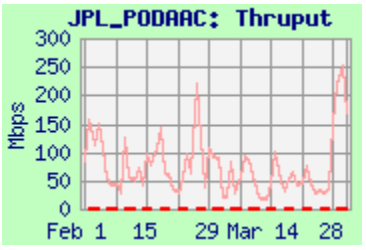
Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	Jan-May '08	**43.6**	**Good**
GSFC → JPL AIRS	Jan-May '08	35.2	**Good**
GSFC → JPL MLS	Jan-May '08	5.9	**Good**
GSFC → JPL PODAAC	Jan-May '08	1.5	**Excellent**
GSFC → JPL QSCAT	Jan-May '08	1.0	**Excellent**



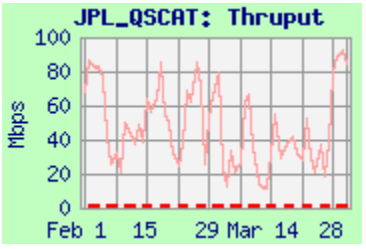


Comments: **The GSFC to JPL combined requirement was reduced this month (effective Jan 1 '08), due mostly to revision of the GEOS 5 flows** (the requirement was 113 mbps previously). The rating upgrade this last month is substantially due to this requirements decrease – the measured performance was mostly consistent.

The EBnet to Doors congestion at GSFC is the bottleneck for these flows, and creates large variations in performance (After the NISN to JPL campus connection upgrade to Gig E in September '07). The user flow from GSFC/EOS was similar to last month, not very far below the requirement without contingency.

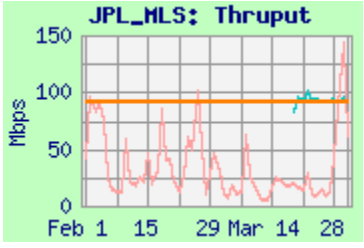


AIRS, Overall: Median thruput is between 2X and 3X the AIRS requirement; the rating is "Good". **The JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the overall rating is also "Good"



PODAAC: Thruput peaks are now well over 100 mbps. Median thruput decreased, however, due to the increased congestion at GSFC. The GSFC-PODAAC requirement (for MODIS data) is only 1.5 mbps, rating "Excellent"

QSCAT: The median thruput from GSFC-PTH now peaks close to 100 mbps – limited by a Fast-E connection at QSCAT, and congestion at GSFC. The QSCAT requirement is only 1.3 mbps, rating "Excellent".



MLS: The GSFC-MLS 7.4 mbps requirement is for MLS and GEOS flow, and was reduced this month. Testing from GSFC-NISN was added in April to avoid the EBnet congestion seen from GSFC-PTH. The rating from GSFC-PTH is "Good", but from GSFC-NISN it would be "Excellent".

3.2) LaRC ←→ JPL

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

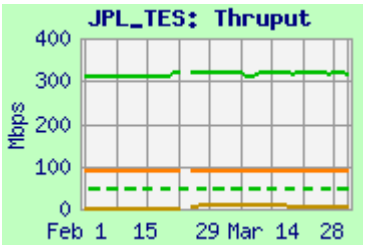
Web Pages:
http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtml
http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

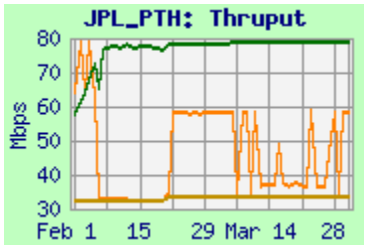
Test Results:

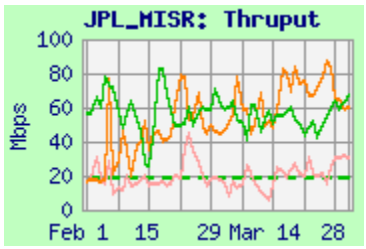
Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
LaRC DAAC → JPL-TES	322.4	320.5	246.0
LaRC PTH → JPL-TES	91.3	91.2	91.2
LaRC PTH → JPL-TES sftp	11.5	11.3	7.2
LaRC PTH → JPL-PTH sftp	33.6	33.6	33.4
LaRC DAAC → JPL-MISR	88.3	64.2	33.8
JPL-PTH → LaRC PTH	87.5	87.5	62.9

Requirements:

Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 – '08	29.8	**Excellent**
LaRC DAAC → JPL-MISR	FY '07 – '08	18.5	**Excellent**
LaRC → JPL-Combined	FY '07 – '08	45.8	**Excellent**
JPL → LaRC	FY '07 – '08	4.4	**Excellent**





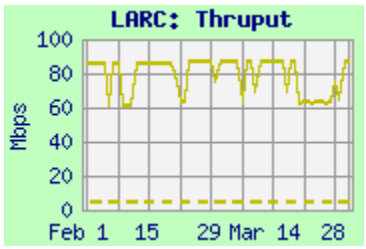


Comments: LDAAC was moved to campus address space in March '07. User flow data is no longer available from LaRC (has been requested but not implemented). Thus no integrated graphs are available from LaRC.

LaRC→ JPL (Overall, TES): Performance for most tests improved and stabilized in Sept. '07 with the NISN to JPL Ethernet upgrade, and the ratings improved. Median performance from LDAAC to JPL-TES was over 3 x the combined requirement (also over the TES requirement), so the Overall and TES ratings remain "Excellent". The TES system was upgraded in late February; the window size and sftp performance increased with that upgrade – but declined again in mid-March. due to TCP window limitations Sftp results are much better from LaRC-PTH to JPL-PTH which has been patched to increase this window size.

LARC → JPL (MISR): Median thruput was again noisy, but somewhat better than last month; the rating remains "Excellent".

JPL → LaRC: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. Thruput was again bimodal (along with other JPL-PTH flows). The requirement was reduced this month from 52.6 mbps last month, so the rating improves to "Excellent"



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3.3) JPL ASTER IST:

Performance from ERSDAC to the JPL-ASTER-IST is now shown in section 7 (ERSDAC).

4) Boulder CO:

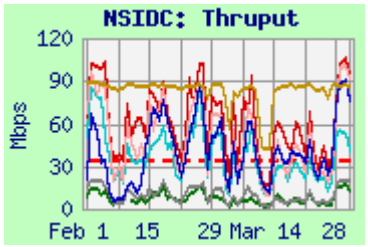
4.1) GSFC → NSIDC:

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

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

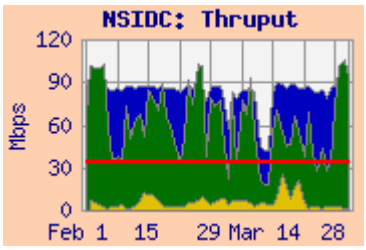
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS → NSIDC-DAAC	88.8	84.7	55.7	6.1	85.9
GSFC-DAAC → NSIDC-DAAC	106.3	52.3	17.1		
GSFC-ENPL → NSIDC_u	114.4	110.5	68.1		
GSFC-ISIPS → NSIDC (iperf)	66.3	28.6	10.1		
GSFC-ISIPS → NSIDC (ftp)	19.8	5.9	2.8		

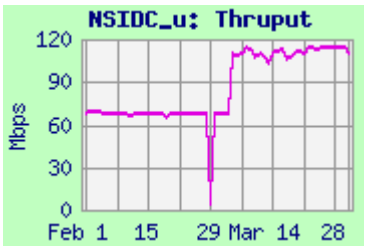


Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '08	34.5	Good



Comments: GSFC → NSIDC: This rating is based on testing from the MODAPS PDR server to the NSIDC DAAC via NISN PIP, since this is the primary production flow. The thruput values were mostly stable this month, but were noisy, due to congestion at GSFC. The requirement was reduced this month (was 64 mbps last month) due to the use of compression in MODIS collection 5. The Integrated thruput is above this lower requirement, by more than 30%, so the rating remains "Good". Note that the integrated graph shows that the user flow remains **MUCH lower,** even than the reduced requirement.



GSFC → NSIDC_u via Internet2: Results via Internet2 are now also shown above, in the interest of possibly switching the production flows from PIP to Internet2. Thruput on this path was steady above the requirement. This testing was retuned in March, with improved results. So from a performance viewpoint, it appears that this is a viable option.

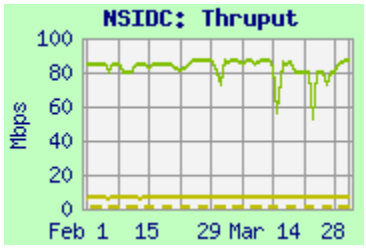
GSFC-ISIPS ← → NSIDC: Testing was retuned in December, and has been stable since then, subject to the EBnet congestion at GSFC. FTP thruput was much lower than iperf due to TCP window size limitations.

4.2) JPL → NSIDC:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
JPL PTH → NSIDC-PTH	86.6	84.4	24.1	1.34
JPL PODAAC → NSIDC	7.0	6.6	5.2	



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 2 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".

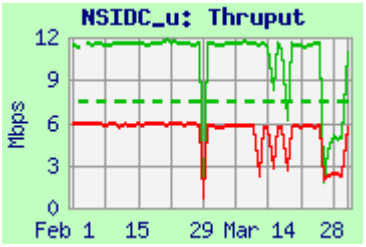
4.3) GHRC → NSIDC:

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

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Req.**
GHRC → NSIDC DAAC (iperf)	12.3	11.5	2.9	7.5
GHRC → NSIDC DAAC (ftp)	5.8	5.7	2.2	



Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via Internet2. The thruput was stable this month, and the median remains more than 30 % over the requirement, so is rated "Good". The user flow averaged only 870 kbps this month, well below the requirement.

4.4) LASP:

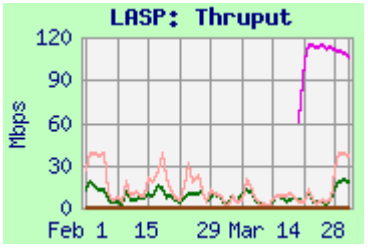
Ratings: GSFC → LASP: Continued **Excellent**

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	21.6	5.9	1.9	0.4
GSFC PTH → LASP (iperf)	37.6	6.9	1.8	
GSFC ENPL → LASP	114.2	111.7	86.1	
GSFC PTH → LASP (sftp)	0.46	0.45	0.42	



Comments: ASF → LASP: Testing from ASF remains down since October '07, when the ASF IOnet test node stopped working, due to reconfiguration at ASF.

GSFC → LASP: Iperf thruput is very noisy (note the 20:1 ratio in best to worst from GSFC-PTH). This is attributed to [increasing] congestion at GSFC, but is well above the requirement, so the rating continues "Excellent". Sftp thruput is steady but MUCH lower than iperf, due to window size limitations -- a patch is available. In March, an additional test was initiated from GSFC-ENPL via Internet2, avoiding the EBnet congestion at GSFC and the IOnet circuit. Its performance is much higher and steadier. The user flow on IOnet averaged 90 kbps this month, about the same as recent months.

4.5) NCAR:

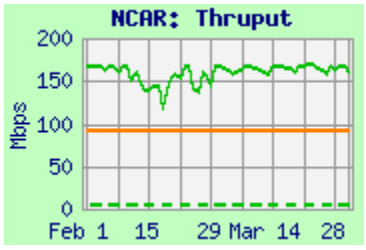
Ratings: LaRC → NCAR: Continued **Excellent**

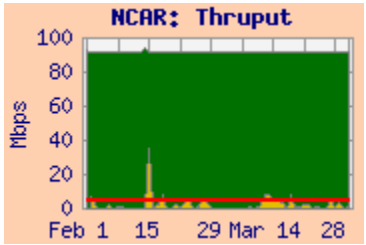
GSFC → NCAR: Continued **Excellent**

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Requirement**
LaRC → NCAR	167.9	165.3	82.7	5.4
GSFC → NCAR	92.2	92.1	90.3	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 '07, 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 200 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 1.9 mbps (vs 2.4 mbps last month).

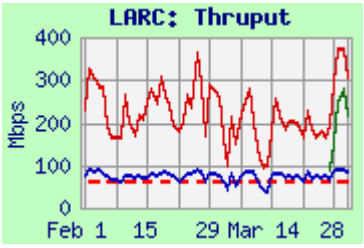
5) GSFC → LaRC:

Ratings: GSFC → LaRC: ↑ Good → **Excellent**

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

Test Results:

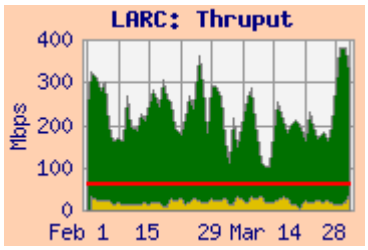
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	357.7	201.4	105.7	21.2	203.4
GSFC-EDOS → LDAAC	346.1	217.8	34.6		
GSFC-PTH → LaRC-PTH	90.5	74.3	43.1		
GSFC-NISN → LaTIS	383.9	347.3	217.0		
GSFC-PTH → LaRC-ANGe	405.1	291.7	185.7		



Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '08	60.5	**Excellent**

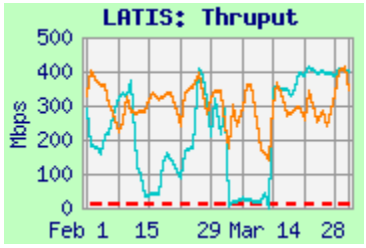
Comments:



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

Testing was added in late march from EDOS – its performance is similar to GDAAC, but even noisier, due to additional firewalls to traverse. 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 21.2 mbps average user flow was a bit higher than last month's 19.4 mbps. The integrated graph shows that user flow was fairly steady. **Significant GEOS flows are apparently NOT occurring at this time.**



LaTIS: The thruput to LaTIS via PIP (from GSFC-PTH) was again noisy but mostly stable this month. The GSFC-NISN test node developed problems in late January (fixed in mid March), so those results are only somewhat meaningful at this time.

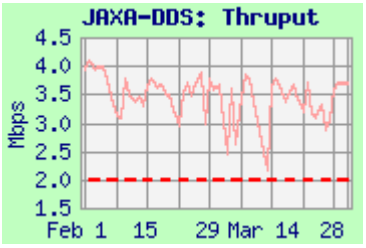
6) US ←→ JAXA:

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

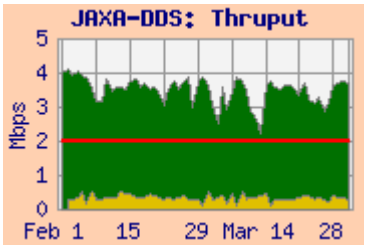
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.03	3.45	2.23	0.34	3.53
GSFC-ENPL → JAXA-azusa	75.0	67.0	42.2		
GSFC-PTH → JAXA-azusa	38.0	15.5	6.5		
GSFC-PTH → JAXA (sftp)	0.84	0.80	0.66		
JAXA-DDS → JPL-QSCAT	3.3	3.2	2.5		
JAXA-DDS → GSFC-DAAC	1.10	1.10	1.09		
JAXA-azusa→ GSFC-MAX	86.1	85.8	44.5		



Requirements:

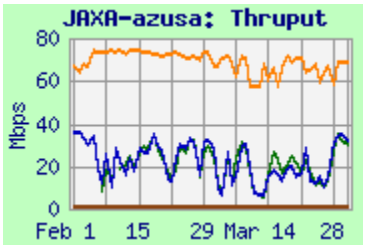
Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Mar '08	1.99	Good
JAXA → US	Nov '03 – Mar '08	1.28	Good



Comments:

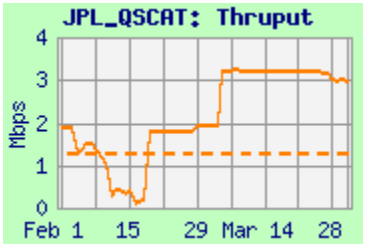
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Performance was mostly stable this month, but subject to the EBnet to Doors congestion at GSFC. Thruput was above the requirement, but by less than 3x; so the rating remains "Good".

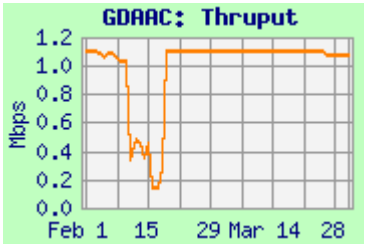
The integrated graph shows consistent user flow, about 17% of the requirement (or 25% of the requirement without the contingency).

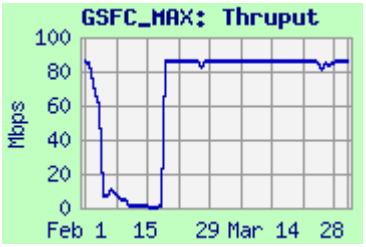


Azusa: Performance from GSFC-PTH and GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp 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, for about 2 weeks in February, due to increased packet loss in Japan! This was fixed in late February. Average thruput from JAXA to JPL was above the requirement by more than 30%, so the rating improves back to "Good". Thruput was much higher from Azusa to GSFC, with a 100 mbps Ethernet connection, and larger TCP windows. It also had a similar step function in February.







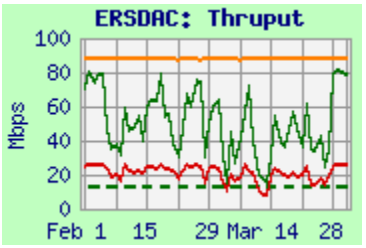
7) ERSDAC ←→ US:

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	82.3	41.0	15.2	4.3	42.5
GDAAC → ERSDAC	26.2	19.6	10.0		
GSFC ENPL (FE) → ERSDAC	88.6	88.4	79.2		

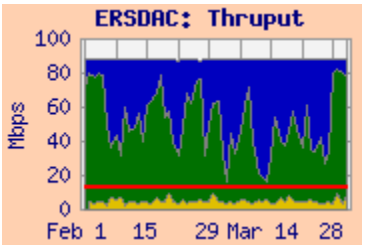


Requirements:

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

Comments: Dataflow from GSFC to ERSDAC has been via APAN since 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.

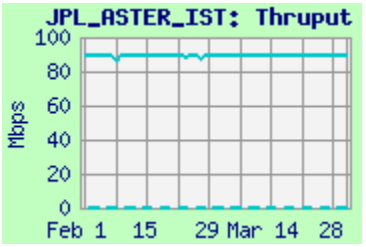


The thruput from GDAAC to ERSDAC appears to be limited by packet loss at the GigE to FastE switch at Tokyo-XP. The GigE GDAAC source does not see any bottlenecks until this switch (The Internet2 and APAN backbones are 10 Gbps), and thus exceed the capacity of the switch's FastE output circuit. But the 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	19.7
ERSDAC → EROS	80.1	58.8	21.2



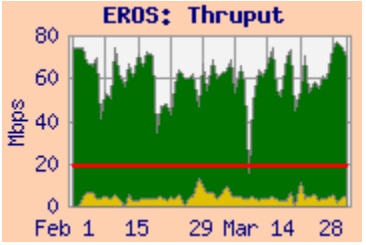
Requirements:

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

Comments:

ERSDAC → JPL-ASTER-IST: This performance is a little noisy (similar to last month), and must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were 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 4.5 mbps in March, in the normal range for recent months, and well below the requirement.



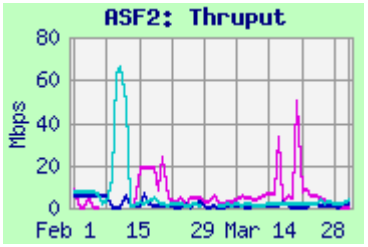
8) ASF

Ratings: IOnet: X Discontinued
WSC → ASF: n/a

Web Page: http://ensight.eos.nasa.gov/Organizations/production/ASF2.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
WSC	8.7	1.7	0.21
GSFC	59.4	4.7	0.14
JAXA	4.4	0.6	0.09



Comments: The ASF IOnet host and firewall was reconfigured in October '07, and all IOnet testing stopped at that time.

WSC to ASF: Testing was started in January from White Sands (WSC) to ASF for the ALOS mission. The route is from WSC via NISN SIP, peering with Internet2 at one of several possible peering points. Internet2 connects to the "Pacific Northwest Gigapop" (PNW) in Seattle. From there the University of Alaska – Fairbanks (UAF) has a dedicated OC-3 circuit to campus, then via campus LAN to the Alaska Satellite Facility (ASF).

There is no firm requirement at this time, but it has been estimated at about 20 mbps.

Test results from all sources are quite poor. This was traced to out of date Ethernet driver software on the test machine at ASF, and repaired in April. But for March, the 20 mbps requirement has clearly not been met.

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9) Other SIPS Sites:

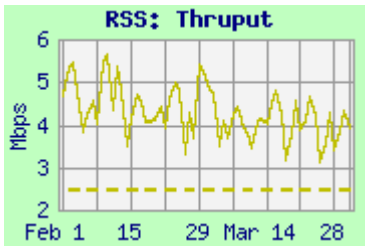
Web Pages http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	5.6	4.1	1.9	2.4	Continued **Good**
OMISIPS → KNMI-ODPS	18.7	15.5	10.1	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, and remains "Excellent". The user flow averaged only 2.0 mbps in March, about normal for recent months, and consistent with the requirement, as shown on the integrated graph.