EOS Production Sites
Network Performance Report: September 2008

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

Highlights:

- **Mostly stable flows with continued congestion at GSFC**
  - GPA 3.32 (Last month: 3.39)
- **Only 2 flows below "Good"**
  - **GSFC MODAPS-PDR to EROS** ("**Low**")
    - Due to EBnet to Doors congestion at GSFC
  - JPL to RSS: ("**Low**")
    - Low iperf results are probably due to high user flow
- **Bottlenecks:**
  - GSFC: EBnet to Doors Gig-E
- Significant improvements are noted in Green, Network problems in Red, **System problems in Gold**, and comments in Blue.

Ratings Changes: (See site discussion below for details)

Upgrades: ↑ None

Downgrades: ↓:

JPL → RSS: Almost Adequate → **Low**

EDOS → LASP: Excellent → **Good**

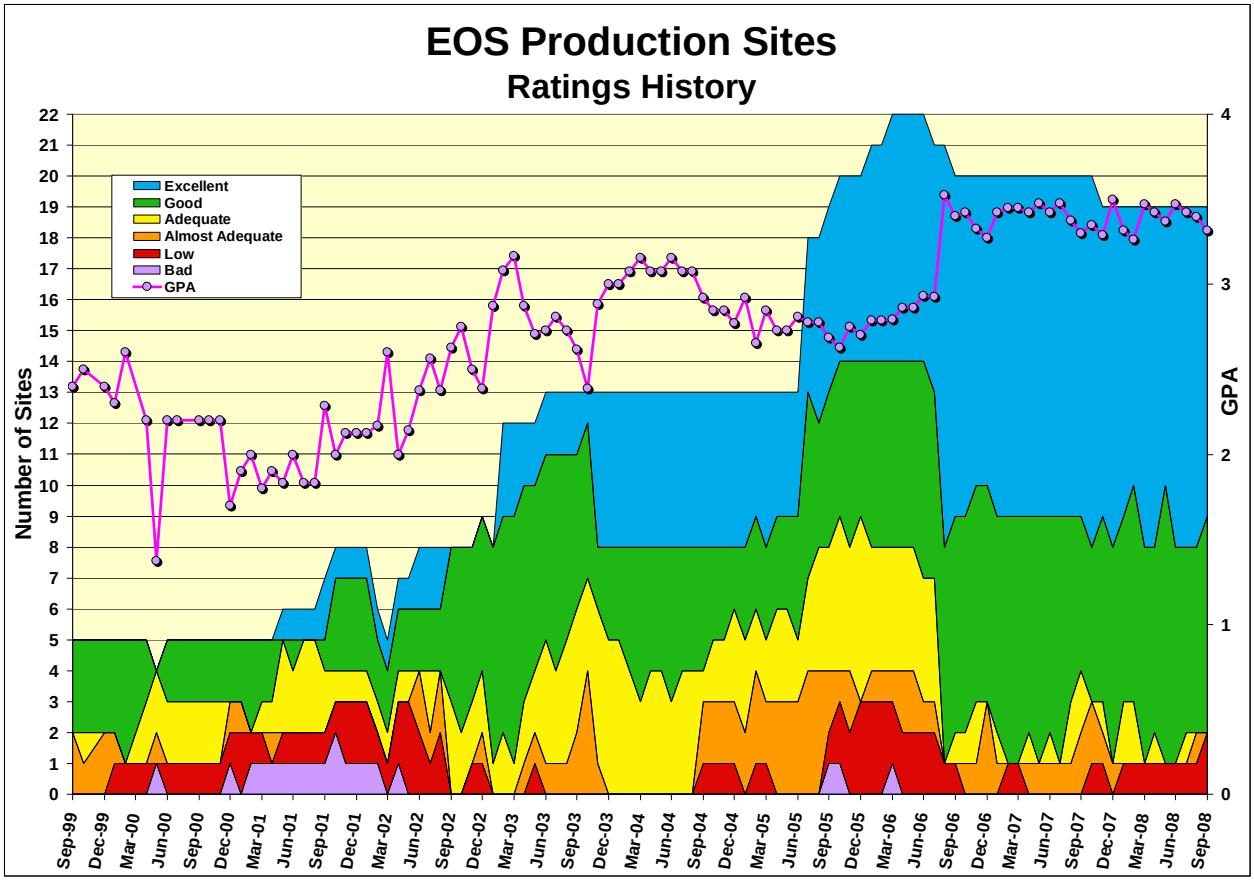
Testing Down X**:**

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

Ratings Categories:

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

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

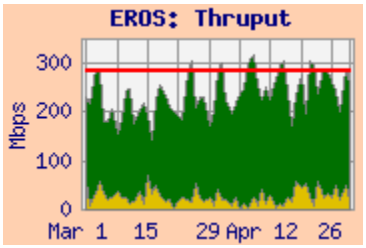


The chart above shows the number of sites in each classification since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements.

Requirements Basis:

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

Integrated Charts:



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

Network Requirements vs. Measured Performance

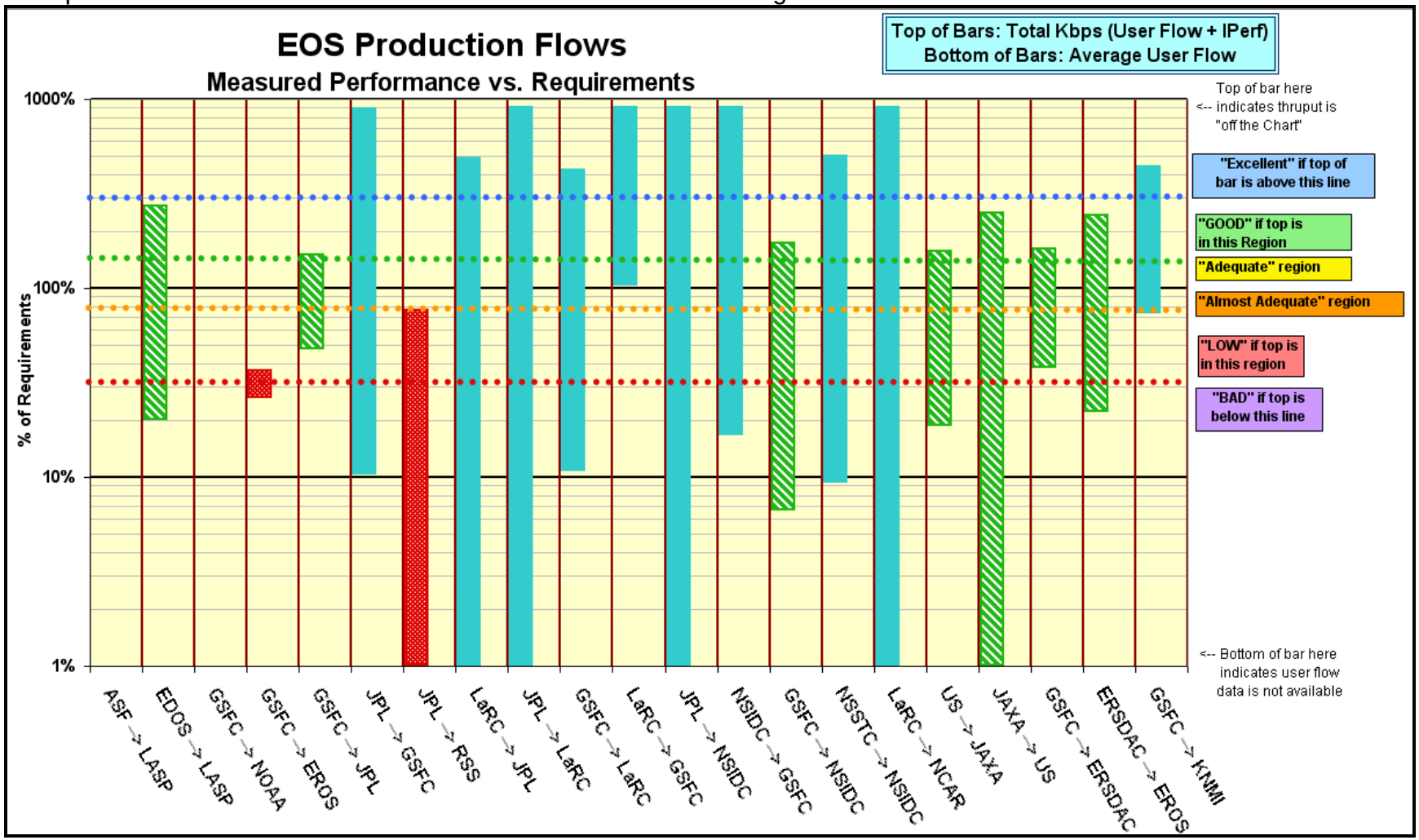
September 2008		Requirements (mbps)		Testing				Ratings		
Source → Destination	Team (s)	Current Sep-08	Future Oct-09	Source → Dest Nodes	Avg User Flow mbps	iperf Avg mbps	Integrated mbps	Rating re Current Requirements Sep-08	Last Month	Rating re Oct-09
WSC –> ASF	ALOS	n/a	n/a	WSC → ASF-AADN		20.2		n/a	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]	0.08	1.0		GOOD	E	GOOD
GSFC –> EROS	MODIS, LandSat	345.9	345.9	MODAPS-PDR → EROS LPDAAC	90.0	55.2	126.8	LOW	L	LOW
GSFC –> JPL	AIRS, MLS, ISTs	43.6	38.5	GDAAC → JPL-AIRS	20.6	61.6	65.9	GOOD	G	GOOD
JPL –> GSFC	AMSR-E, MISR, etc.	7.4	7.4	JPL-PTH → GSFC-PTH	0.76	65.3		Excellent	E	Excellent
JPL –> RSS	AMSR-E	2.5	2.5	JPL-PODAAC → RSS		1.9		LOW	A A	LOW
LaRC –> JPL	TES, MISR	43.2	43.7	LARC-DAAC → JPL-TES		210.5		Excellent	E	Excellent
JPL –> LaRC	TES	4.4	4.4	JPL-PTH → LARC-PTH		63.7		Excellent	E	Excellent
GSFC –> LaRC	CERES, MISR, MOPITT	60.5	48.7	GDAAC → LDAAC	6.5	254.9	255.6	Excellent	E	Excellent
LaRC –> GSFC	MODIS, TES	0.2	0.2	LDAAC → GDAAC	0.2	379.1	379.1	Excellent	E	Excellent
JPL –> NSIDC	AMSR-E	1.3	1.3	JPL-PTH → NSIDC SIDADS	0.004	81.6		Excellent	E	Excellent
NSIDC –> GSFC	MODIS, ICESAT, QuikScat	0.5	0.5	NSIDC DAAC → GDAAC	0.08	115.1	115.1	Excellent	E	Excellent
GSFC –> NSIDC	MODIS, ICESAT, QuikScat	34.5	34.5	MODAPS-PDR → NSIDC-DAAC	2.3	58.5	59.8	GOOD	G	GOOD
NSSTC –> NSIDC	AMSR-E	7.5	7.5	NSSTC → NSIDC DAAC	0.7	37.7	37.7	Excellent	E	Excellent
LaRC –> NCAR	HIRDLS	5.4	5.4	LDAAC → NCAR		136.3		Excellent	E	Excellent
US –> JAXA	QuikScat, TRMM, AMSR	2.0	2.0	GSFC-PTH → JAXA DDS	0.37	3.08	3.12	GOOD	G	GOOD
JAXA –> US	AMSR-E	1.3	1.3	JAXA DDS → JPL-QSCAT		3.19		GOOD	G	GOOD
GSFC –> ERSDAC	ASTER	12.5	12.5	EDOS → ERSDAC	4.7	18.1	20.1	GOOD	G	GOOD
ERSDAC –> EROS	ASTER	26.8	26.8	ERSDAC → EROS PTH	5.9	65.6	65.6	GOOD	G	GOOD
GSFC –> KNMI	OMI	3.3	3.3	GSFC-OMISIPS → ODPS	2.4	14.2	14.4	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	Sep-08 Req Score	Sep-08 Req Prev	Oct-09 Req Score
Excellent	10	11	10
GOOD	7	6	7
Adequate	0	0	0
Almost Adequate	0	1	0
LOW	2	1	2
BAD	0	0	0
Total Sites	19	19	19
GPA	3.32	3.39	3.32

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

This graph shows a bar for each source-destination pair – relating the measurements vs the requirements for that pair. The bottom of each bar is the average measured user flow to a site. Thus the bottom of each bar indicates the relationship between the requirements and actual flows. Note that the requirements generally include a 50% contingency factor above what was specified by the projects, so a value of 66% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar represents the integrated measurement, combining the user flow with Iperf measurements – this value is used to determine the ratings



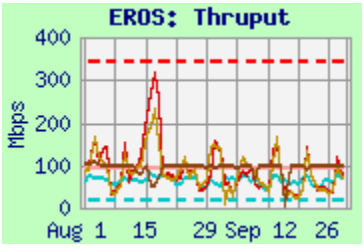
1) EROS:

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

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

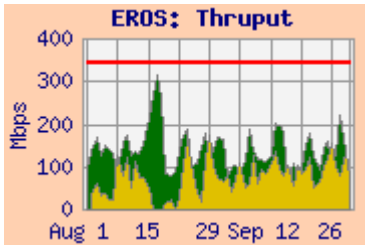
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
MODAPS-PDR→ EROS LPDAAC	142.8	55.2	17.6	90.0	126.8
GES DAAC → EROS LPDAAC	155.0	56.0	24.3		
ERSDAC→ EROS LPDAAC	80.2	65.6	19.5	5.9	65.6
GSFC-EBnet-PTH → EROS PTH	185.2	54.0	21.7		
GSFC-ENPL → EROS PTH	477.2	415.8	300.7		
GSFC-NISN → EROS PTH	479.6	421.0	297.3		
NSIDC→ EROS	102.1	97.7	69.1		
LaRC→ EROS	93.0	93.0	93.0		



Requirements:

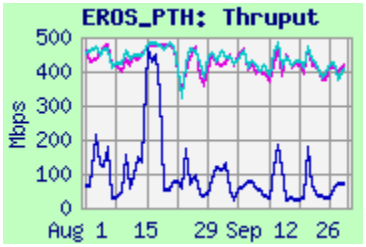
Source → Dest	Date	mbps	Rating
GSFC→ EROS	CY '08-11	346	Low
ERSDAC→ EROS	FY '06 - '08	26.8	Good



Comments:

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

The requirement was increased in May '08 (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 much higher than the 62 mbps last month, and remains far below the nominal requirement.



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

The GSFC-NISN host uses the same NISN route as above, but is connected outside the congested EBnet to Doors Gig-E circuit, so its performance is much higher (peak performance is more than 3 x that of MODAPS) and steadier (the daily worst is better than MODAPS by a factor of about 17:1) than from MODAPS or the GES DAAC. It would be rated "Good".

The ENPL host has a direct connection to the MAX, also bypassing the congested EBnet to Doors Gig-E circuit. It uses he previous Internet2 route. Performance is very similar to the GSFC-NISN source

ERSDAC → EROS: Performance was relatively steady this month. See section 7 (ERSDAC) for the graph and further discussion of this performance.

NSIDC → EROS: Performance was very steady this month.

LaRC → EROS: The thruput from LaRC-PTH to EROS-PTH was again very stable this month via NISN to the Chicago CIEF. Thruput is limited to 100 mbps by the Fast-E connection at LaRC-PTH.

2) to GSFC

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

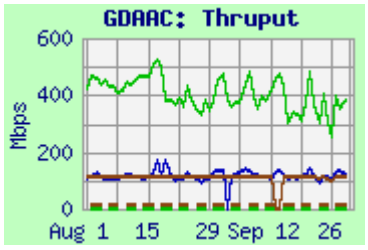
Web Pages:
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/GSFC_PTH.shtml

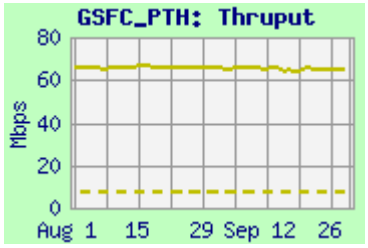
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
EROS LPDAAC → GSFC DAAC	145.9	116.5	81.9		
EROS PTH→ GSFC PTH	459.0	425.7	348.6		
JPL-PTH→ GSFC PTH	66.0	65.3	62.8	0.8	
LDAAC → GDAAC	465.8	379.1	156.8	0.2	379.1
LARC-ANGe → GSFC-PTH	339.6	240.4	201.0		
NSIDC DAAC → GSFC-DAAC	116.4	115.1	106.0	0.1	

Requirements:

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





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

JPL → GSFC: Thruput was stable at 65 mbps for the last 4 months (but was previously bimodal at either 65 or 90 mbps, since 2007 (thruput from JPL-PTH to LaRC-PTH is similar). With the modest requirement, the rating remains "Excellent".

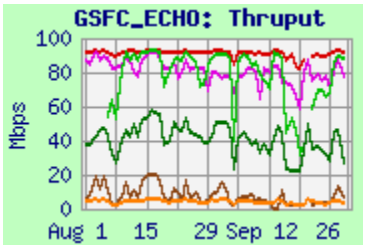
LaRC → GSFC: Performance from LDAAC → GDAAC improved with retuning in November '07, and remained much more than 3 x the modest requirement, so the rating continues as "Excellent". The user flow was about the same as recent months.

NSIDC → GSFC: Performance from NSIDC to GSFC was very steady this month; with the low requirement the rating remains "Excellent". The user flow on this path averaged only 100 kbps.

2.2 GSFC-ECHO

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	62.7	38.3	15.5
EROS LPDAAC ftp	11.3	7.0	3.7
GES DAAC	93.0	91.3	81.6
GES DAAC ftp	91.2	77.8	42.6
LaRC ASDC DAAC	92.3	83.3	19.0
LaRC ASDC DAAC ftp	55.4	37.5	14.0
NSIDC DAAC	17.1	4.0	1.8
NSIDC DAAC ftp	5.6	3.9	2.0



Testing is performed to GSFC-ECHO from the above nodes, both iperf and ftp. Results are generally steady, and show limitations from the 100 mbps fast-E and TCP window size – especially on ftp.

3) JPL:

3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Good**

Web Pages:

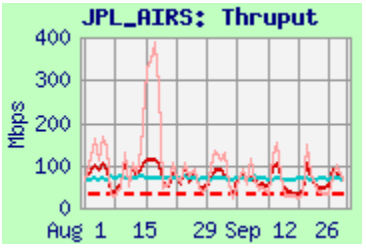
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

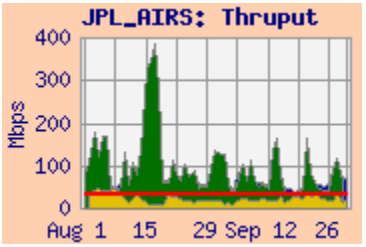
Test Results:

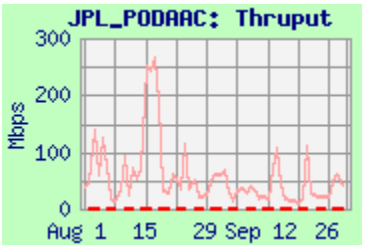
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GSFC-PTH → JPL-AIRS	194.5	56.2	23.9	21.2	61.5
GSFC-DAAC→ JPL-AIRS	107.0	61.6	31.1		
GSFC-PTH → JPL-PODAAC	99.8	28.7	12.6		
GSFC-PTH → JPL-QSCAT	71.0	22.2	10.0		
GSFC-PTH → JPL-MLS	89.8	19.2	9.1		
GSFC-NISN → JPL-MLS	112.9	91.0	86.3		

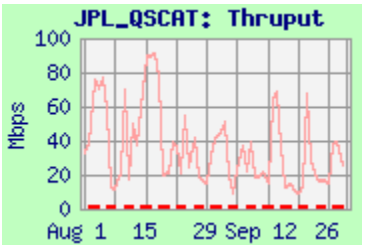
Requirements:

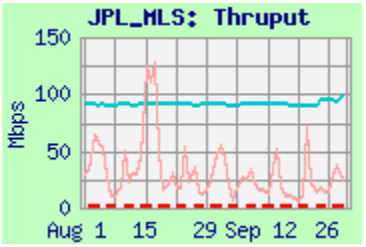
Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	Jan '08-Sept '08	**43.6**	**Good**
GSFC → JPL AIRS	Jan '08-May '09	35.2	**Good**
GSFC → JPL PODAAC	Jan '08-May '11	1.5	**Excellent**
GSFC → JPL QSCAT	Jan '08-May '11	1.0	**Excellent**
GSFC → JPL MLS	Jan '08-Sept '08	5.9	**Excellent**











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

The EBnet to Doors congestion at GSFC is the bottleneck for most of these flows, and creates large variations in performance (After the NISN to JPL campus connection upgrade to Gig E in September '07). The user flow from GSFC/EOS was a bit lower than last month's 24 mbps, and was consistent with the requirement without contingency.

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

PODAAC: Thruput peaks are over 200 mbps, while median thruput is much lower, due to congestion at GSFC. The GSFC-PODAAC requirement (for MODIS data) is only 1.5 mbps, rating "Excellent"

QSCAT: The median thruput from GSFC-PTH 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 requirement is for MLS and GEOS flow, and was reduced in April '08. Thruput from GSFC-PTH was noisy and a bit lower than last month. Testing from GSFC-NISN avoids the EBnet congestion seen from GSFC-PTH –although the peaks were similar, the median and daily worst were much higher than from GSFC-PTH.

3.2) LaRC ←→ JPL

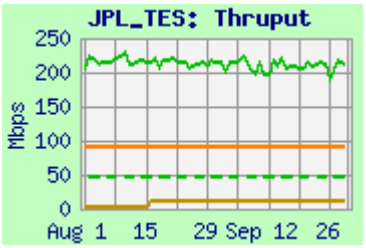
Ratings: LaRC → JPL: Continued **Excellent**
JPL → LaRC: Continued **Excellent**

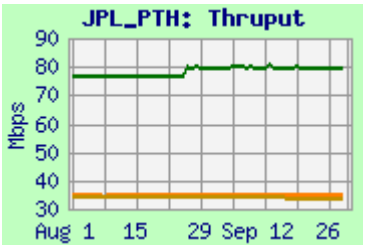
Web Pages:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
LaRC DAAC → JPL-TES	247.2	210.5	22.7
LaRC PTH → JPL-TES	91.3	91.2	91.0
LaRC PTH → JPL-TES sftp	11.6	11.4	10.2
LaRC PTH → JPL-PTH sftp	34.0	33.9	33.7
LaRC DAAC → JPL-MISR	87.8	65.7	4.3
LaRC PTH → JPL-MISR	88.8	73.8	27.0
JPL-PTH → LaRC PTH	63.9	63.7	62.0





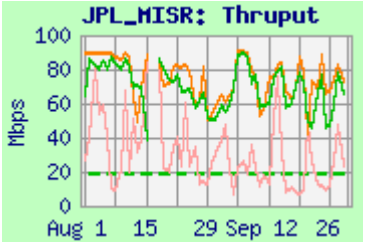
Requirements:

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

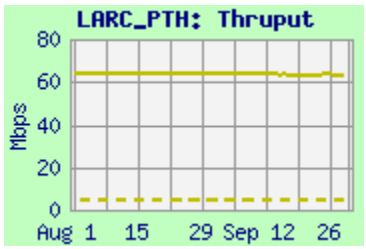
LaRC→ JPL (Overall, TES): Performance for most tests improved in Sept. '07 with the NISN to JPL Ethernet upgrade, and the ratings improved at that time. The LaRC DAAC test node was replaced in July '08; median performance from LDAAC to JPL-TES was lower from the new system than the old one (median was 325 mbps), but is still well over 3 x the TES and combined requirements, so the TES and Overall ratings remain "Excellent".

The TES system was upgraded in February '08; the sftp window size and sftp performance increased with that upgrade – but declined back to 3.5 mbps in mid-March again due to TCP window limitations This was corrected in August, with a corresponding thruput increase. Sftp results are even better from LaRC-PTH to JPL-PTH which uses an even larger window size.



LARC → JPL (MISR): Median thruput was again a bit noisy; the rating remains "Excellent".

The very low daily worst from LaRC DAAC to TES and MISR (compared to the respective daily medians) is attributed to congestion on the LaRC campus LAN. Note that the thruput from LaRC-PTH (which is connected directly to NISN), to the same destinations, is similar, but has a much higher worst case.



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 stable this month (not bimodal like other JPL-PTH flows previously). The requirement was reduced in April from 52.6 mbps previously, so the rating improved to "Excellent" at that time.

4) Boulder CO:

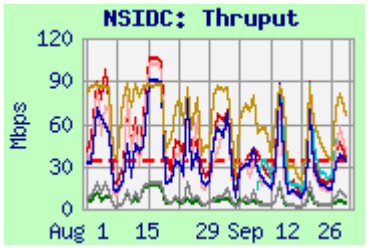
4.1) GSFC → NSIDC:

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

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

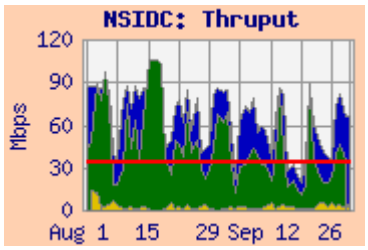
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODIS-PDR → NSIDC-DAAC	88.1	58.5	20.3	2.3	59.8
GSFC-DAAC → NSIDC-DAAC	81.7	32.5	10.7		
GSFC-ENPL → NSIDC_u	114.1	107.3	62.5		
MODIS-PDR → NSIDC_u	89.1	51.0	15.0		
GSFC-ISIPS → NSIDC (iperf)	84.6	28.2	13.8		
GSFC-ISIPS → NSIDC (ftp)	18.8	4.8	1.8		

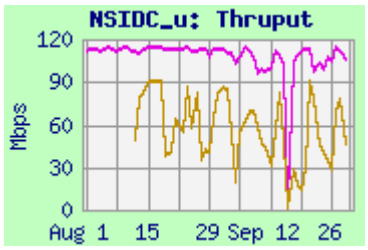


Requirements:

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 in April '08 (was 64 mbps previously) due to the use of compression in MODIS collection 5. The Integrated thruput is above this lower requirement, by more than 30%, so the rating remains "Good". Note that the integrated graph shows that the user flow remains **MUCH lower,** even than the reduced requirement.



GSFC → NSIDC_u via Internet2: Results via Internet2 are now also shown above, in the interest of possibly switching the production flows from PIP to Internet2. Thruput on this path from ENPL was steady and well above the requirement – it would rate "Excellent". So from a performance viewpoint, it appears that this is a viable option. Testing via Internet2 from MODAPS was initiated in August; results are similar to those from MODAPS via NISN.

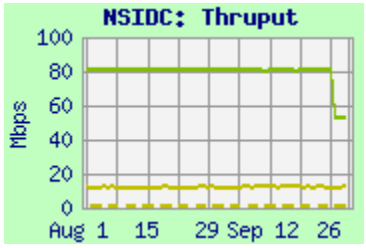
GSFC-ISIPS ← → NSIDC: FTP testing was restarted in August, and iperf testing was restored in September. Results are consistent with previous tests and similar to other GSFC sources.

4.2) JPL → NSIDC:

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	Requirement
JPL PTH → NSIDC-PTH	81.6	81.6	36.6	1.34
JPL PODAAC → NSIDC	13.2	12.4	11.4	



Comments: The test from JPL-PTH to NSIDC-PTH more fully assesses the true network capability – the thruput is much higher than from PODAAC. Thruput from JPL-PTH was stable; it had increased in June back to its higher bimodal value, but decreased again at the end of September. Thruput from PODAAC to NSIDC-SIDADS was much lower but increased in mid July. User flow on this path was only about 5 kbps this month! (Or maybe the flows are going via Internet2?) The rating remains "Excellent".

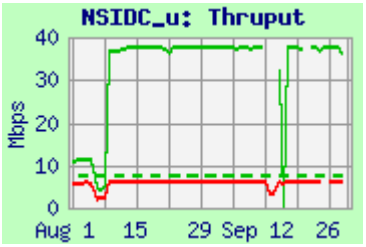
4.3) GHRC → NSIDC:

Ratings: GHRC → NSIDC: Continued **Excellent**

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)	37.9	37.7	24.5	7.5
GHRC → NSIDC DAAC (ftp)	6.2	6.2	5.5	



Comments: GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E L2/L3 data to NSIDC via NISN PIP. The iperf thruput improved in August, when NISN increased the SCR (yes, it's still ATM) on the SIP interface! The ftp performance was limited by the TCP window size, so did not benefit. The median thruput is more than 3x the requirement, so the rating remains "Excellent". The user flow averaged only 700 kbps this month, under 10% of the requirement.

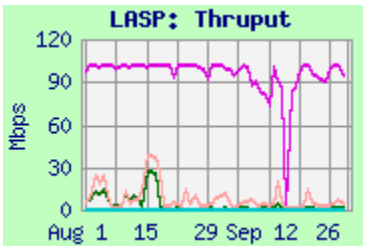
4.4) LASP:

Ratings: GSFC → LASP: ↓ Excellent → **Good**

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Req**
GSFC EDOS → LASP	8.9	1.0	0.01	0.4
GSFC PTH → LASP (iperf)	18.1	4.1	1.4	
GSFC ENPL → LASP	101.8	94.5	45.3	
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 13:1 best:worst ratio from GSFC-PTH); attributed to EBnet congestion at GSFC. The median thruput from EDOS is still well above the requirement, but no longer by 3 x, so the rating drops to "Good". Sftp thruput is MUCH lower than iperf, due to TCP window size limitations. Performance is much higher and steadier from GSFC-ENPL via Internet2, which avoids the EBnet congestion at GSFC. The user flow on IOnet via 84 kbps this month, similar to recent months.

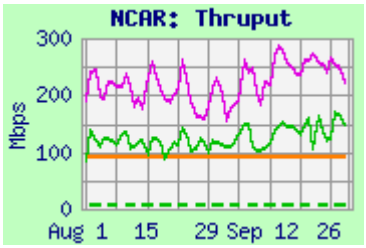
4.5) NCAR:

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

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

Test Results:

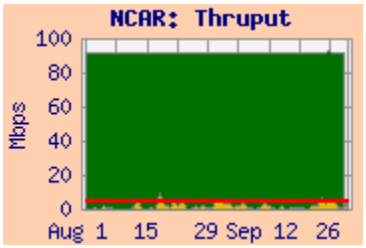
Source → Dest	Medians of daily tests (mbps)			
	Best	**Median**	**Worst**	**Requirement**
LaRC → NCAR	223.4	136.3	10.3	5.4
GSFC-ENPL → NCAR	310.9	243.1	136.3	5.1



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 dropped from a median of 225 mbps with the change in hosts at LaRC in July. It remains well above 3 x the requirement, so the rating remains "Excellent".

From GSFC-ENPL, with a Gig-E connection to MAX, the median thruput is noisy, but also well over 3 x the requirement, so that rating also remains "Excellent".

The Integrated graph shows that the peak user flow from GSFC is fairly consistent with the stated requirement. The average user flow this month was about 1.6 mbps (higher than recent months).



5) GSFC → LaRC:

Rating: Continued **Excellent**

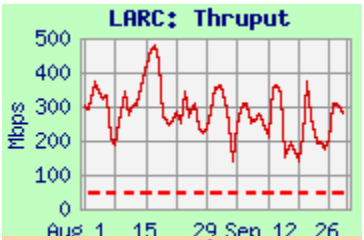
Web Pages: http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml

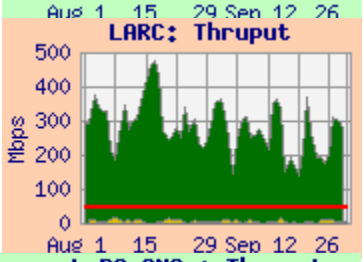
Test Results:

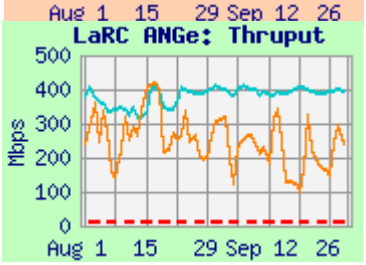
Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
GDAAC → LDAAC	366.1	254.9	146.6	6.5	255.6
GSFC-EDOS → LDAAC	n/a	n/a	n/a		
GSFC-PTH → LaRC-ANGe	342.3	230.3	110.2		
GSFC-NISN → LaTIS	413.1	395.7	329.6		

Requirements:

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







Comments:

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

Testing from EDOS is waiting on firewall rules at GSFC and LaRC to resume with the new host.

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

As seen on the Integrated graph, the 6.5 mbps average user flow was lower than last month's 8.1 mbps, and well below the requirement.

ANGe (LaTIS): The thruput to ANGe via PIP (from GSFC-PTH) was again noisy due to EBnet congestion at GSFC, but mostly stable this month. Testing to LaTIS from GSFC-NISN avoids this congestion, with much more consistent results.

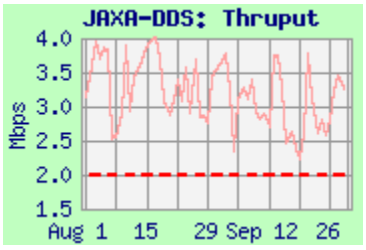
6) US ←→ JAXA:

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

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

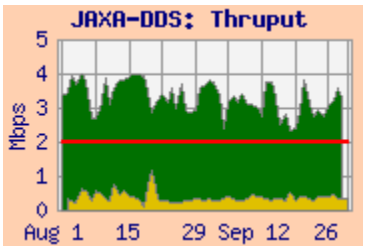
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-PTH → JAXA-DDS	4.04	3.08	2.15	0.37	3.12
GSFC-ENPL → JAXA-azusa	74.7	68.0	46.9		
GSFC-PTH → JAXA-azusa	27.6	10.7	4.8		
GSFC-EDOS → JAXA-azusa	29.3	11.5	3.7		
GSFC-PTH → JAXA (sftp)	0.84	0.76	0.60		
JAXA-DDS → JPL-QSCAT	3.23	3.19	2.58		
JAXA-DDS → GSFC-DAAC	1.10	1.09	1.07		
JAXA-azusa→ GSFC-MAX	85.8	85.0	25.3		



Requirements:

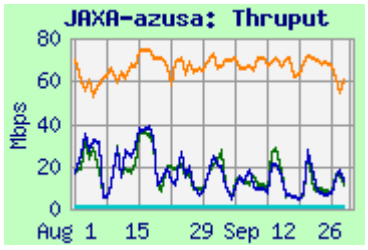
Source → Dest	Date	Mbps	Rating
GSFC → JAXA	Nov '03 – Dec '08	1.99	Good
JAXA → US	Nov '03 – Dec '08	1.28	Good



Comments:

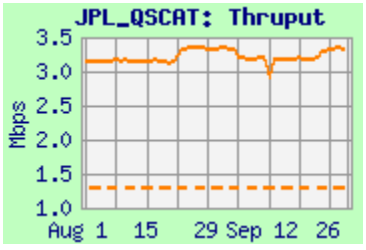
US → JAXA: DDS: Performance from GSFC is limited by TCP window size and the 10 mbps Ethernet at JAXA. Performance was mostly stable this month, but subject to the EBnet to Doors congestion at GSFC. Thruput was above the requirement, by more than 30%, but by less than 3x; so the rating remains "Good".

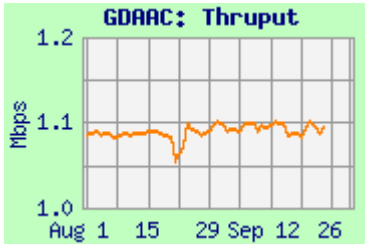
The integrated graph shows fairly consistent user flow, averaging about 20% of the requirement (or 30% of the requirement without the contingency).

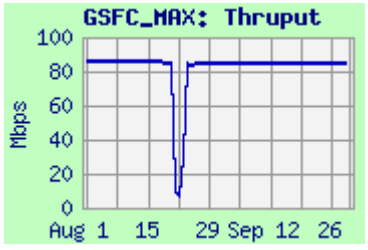


Azusa: Performance from GSFC-ENPL to the JAXA azusa test node is not limited by a 10 mbps Ethernet, so its much higher performance more accurately shows the capability of the networks. The lower value from GSFC-PTH and GSFC-EDOS is due to EBnet congestion, not seen from GSFC-ENPL. But thruput using sftp between these same nodes is much lower, limited by ssh TCP 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 been tuned to fully utilize the increased network capability) and its 10 mbps Ethernet. Average thruput from JAXA to JPL was above the requirement by more than 30%, so the rating remains "Good". Thruput was much higher from Azusa to GSFC, with a 100 mbps Ethernet connection, and larger TCP windows.







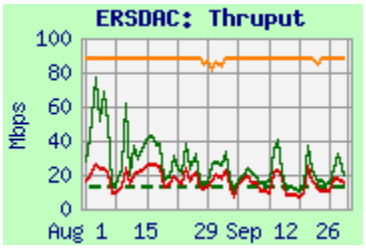
7) ERSDAC ←→ US:

Ratings: GSFC → ERSDAC: Continued **Good**
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	41.4	18.1	10.2	4.7	20.1
GDAAC → ERSDAC	25.0	13.6	7.5		
GSFC ENPL (FE) → ERSDAC	88.5	88.4	72.9		

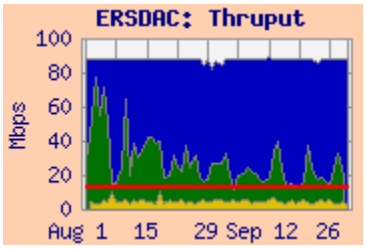


Requirements:

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

Comments: Dataflow from GSFC to ERSDAC has been via APAN since February '05.

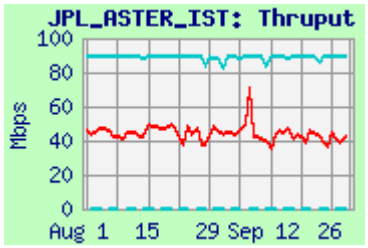
Testing from EDOS to ERSDAC is used as the basis for the rating -- the requirement includes the level 0 flows which used to be sent by tapes. Performance was noisy as usual, due to EBnet congestion; median thruput this month remained below 3 x the requirement, so the rating remains "Good". The integrated chart shows that the user flow continues to be below the requirement, by almost a 3:1 factor.



The thruput from GDAAC to ERSDAC appears to be limited by packet loss at the GigE to FastE switch at Tokyo-XP. The GigE GDAAC source does not see any bottlenecks until this switch (The Internet2 and APAN backbones are 10 Gbps), and thus exceed the capacity of the switch's FastE output circuit. But the FastE connected EDOS and GSFC-ENPL nodes are limited to 100 mbps by their own interfaces, so do not suffer performance degrading packet loss – and the performance is much higher.

ERSDAC → US Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ERSDAC → JPL-ASTER IST	89.8	89.6	12.1
ERSDAC → EROS	80.2	65.6	19.5



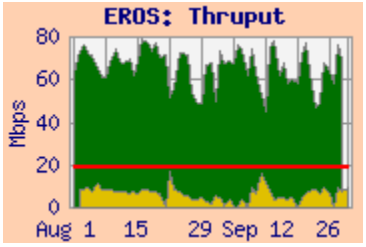
Requirements:

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

Comments:

ERSDAC → JPL-ASTER-IST: This performance this month was mostly very stable, and must be well in excess of the [unstated] requirement (IST requirements are generally 311 kbps).

ERSDAC → EROS: The results from this test (in support of the ERSDAC to EROS ASTER flow, replacing tapes) were again noisy this month. Thruput improved to this present values in April '05. The median thruput is over 2 x the requirement, so the rating remains "Good". This user flow averaged 5.9 mbps this month (was 6.9 mbps last month), about 22% of the requirement.



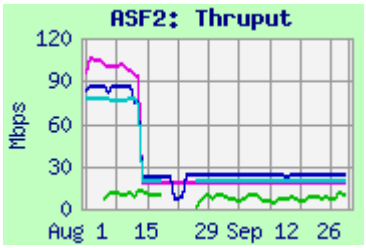
8) ASF

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

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

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
WSC	20.3	20.2	17.6
GSFC	18.7	18.5	17.6
JAXA	23.9	23.8	18.7



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

WSC to ASF: Testing from White Sands (WSC) to ASF is for the ALOS mission. The route is from WSC via NISN SIP, peering with Internet2 at one of several possible peering points. Internet2 connects to the "Pacific Northwest Gigapop" (PNW) in Seattle. From there the University of Alaska – Fairbanks (UAF) has a dedicated OC-3 circuit to campus, then via campus LAN to the Alaska Satellite Facility (ASF). There is no firm requirement at this time, but it has been estimated at about 20 mbps.

Performance dropped significantly in mid August, when the ASF test node was moved to its intended final location, apparently due to LAN problems at ASF. If the 20 mbps requirement is correct, the rating would drop from "Excellent" to "Adequate". This situation is under investigation.

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9) Other SIPS Sites:

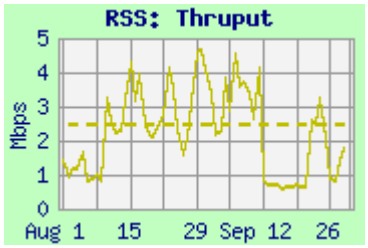
Web Pages http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml
http://ensight.eos.nasa.gov/Missions/aura/KNMI_OMIPDR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**Reqmt**	**Rating**
JPL → RSS	4.26	1.91	0.57	2.5	**Almost Adequate → Low**
OMISIPS → KNMI-ODPS	18.4	14.2	8.9	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 dropped below the requirement this month, now by more than 30%, so the rating drops to "Low".



Note that with the present configuration (passive servers at both RSS and GHRC), the RSS to GHRC performance cannot be tested.

8.2 KNMI: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam. The rating is based on the results from OMISIPS at GSFC to the ODPS primary server, protected by a firewall, and remains "Excellent". The user flow averaged 2.4 mbps this month, about normal for recent months, and consistent with the requirement, as shown on the integrated graph.