

## EOS Production Sites Network Performance Report: November 2011

This is a monthly summary of EOS network performance testing between production sites -- comparing the measured performance against the requirements. Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.

### Highlights:

- **Mostly stable flows**
  - **GPA 3.83** (same as last month)
- **Requirements:** updated to Handbook 1.4.3 in May '09 (was 1.4.2 previously)
  - Many Requirements dropped significantly (under review)
- **Only 2 flows below "Excellent"; only 1 below "Good":**
  - **GSFC MODAPS-PDR to EROS** ("Almost Adequate")
    - Only slightly below "Adequate"

### Ratings Changes:

**Upgrades:** ↑ None

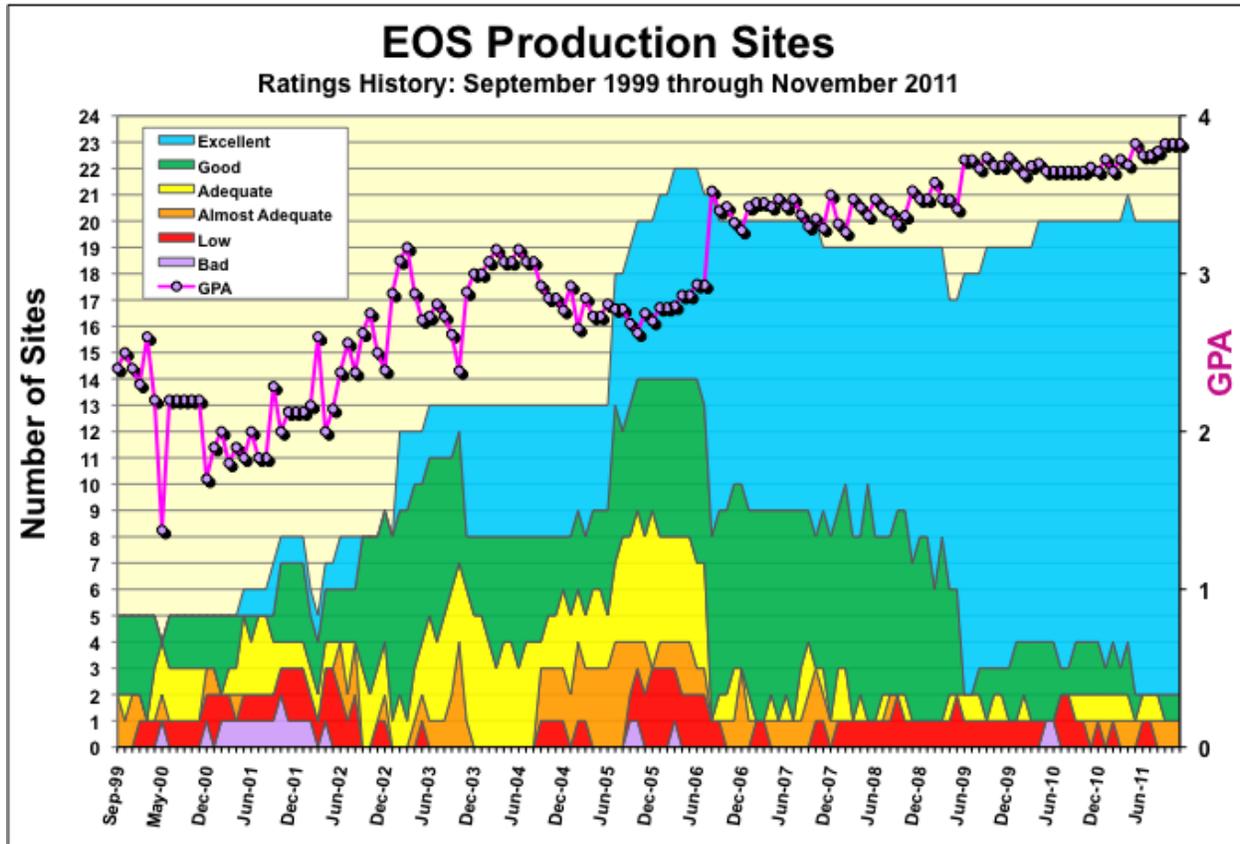
**Downgrades:** ↓ None

### Ratings Categories:

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

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

**Ratings History:**



The chart above shows the number of sites in each rating category 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.

**Additions and deletions:**

- 2011 April: Added RSS to GHRC
- 2011 May: Deleted WSC to ASF for ALOS

### **Requirements Basis:**

While the long-term plan is to use the requirements from the EOSDIS network requirements database, the database does not appear ready to be used for that purpose at this time. ESDIS is in process of reviewing its network ICD's with each instrument team. When these ICDs are completed, the database will be updated with the ICD values, and those values will be used here as well.

Until then, the requirements are based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Previously, the requirements were derived from version 1.4.2.

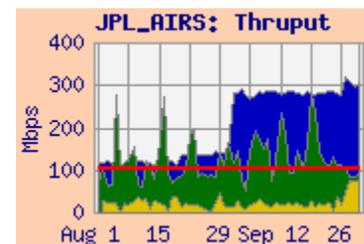
One main difference between Handbooks 1.4.2 and 1.4.3 is that most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

However, it seems likely that there are some flows which have been omitted from version 1.4.3. For example, the GES DISC to KNMI requirement for Level 1+ data (without contingency) was 1.4 mbps in version 1.4.2, but only 22 kbps in version 1.4.3. The user flow has been averaging about 1.4 mbps, suggesting that version 1.4.2 was correct, and that version 1.4.3 has omitted something.

### **Integrated Charts:**

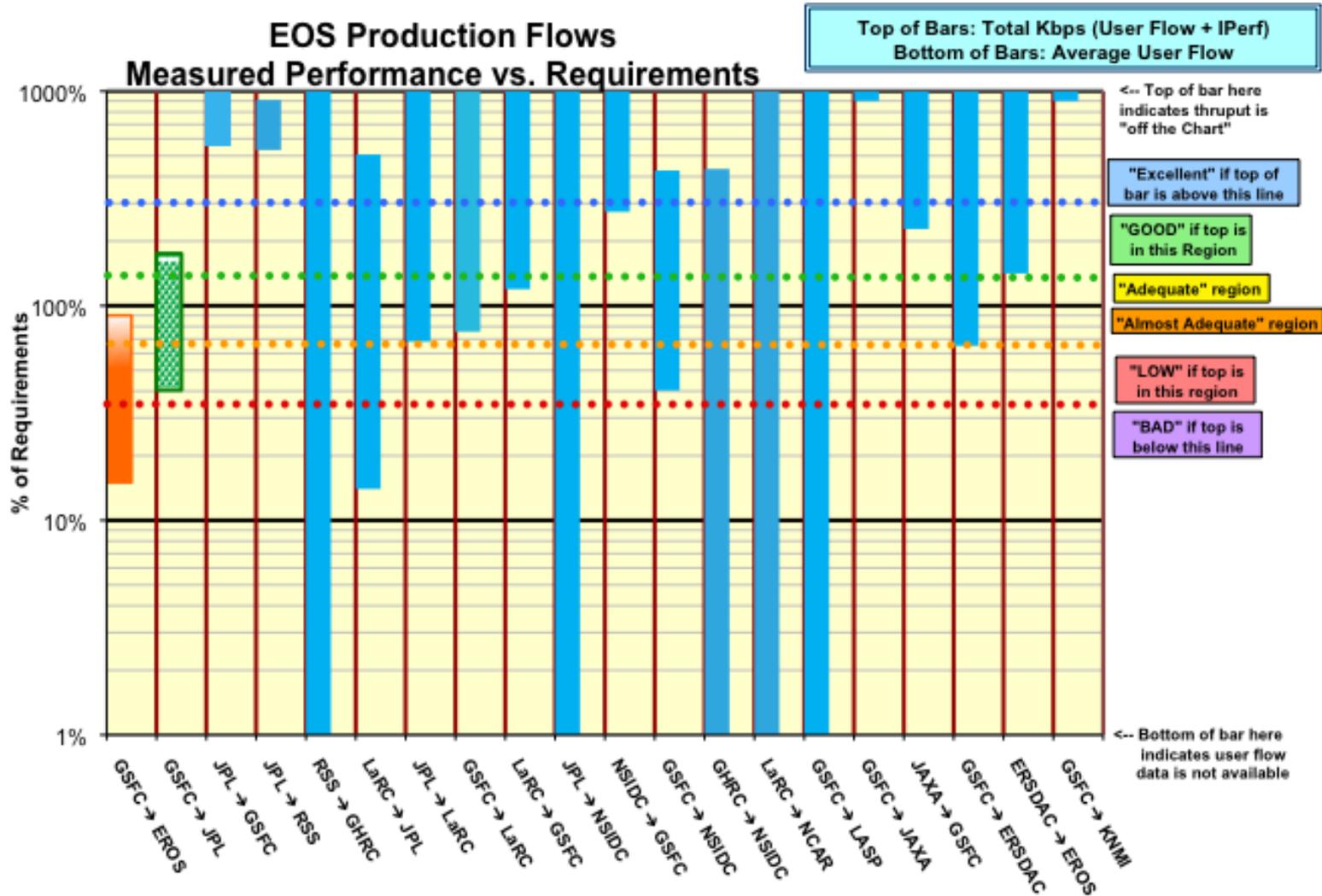
Integrated charts are included with site details, where available. These charts are "Area" charts, with a "salmon" background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (JPL, 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 thrupt 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. 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. On some charts a blue area is also present – usually "behind" the green area – representing adjusted iperf measurements from a second source node at the same facility.



Network Requirements vs. Measured Performance

November 2011		Requirements (mbps)		Testing				Ratings	
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re HB 1.4.3 Requirements	
		HB 1.4.3	HB 1.4.2					This Month	Last Month
GSFC → EROS	MODIS, LandSat	342.9	345.9	MODAPS-PDR → EROS LPDAAC	51.5	292.7	309.0	AA	AA
GSFC → JPL	AIRS, MLS, ISTs	101.7	43.6	GES DISC → JPL-AIRS	41.2	172.4	177.9	Good	Good
JPL → GSFC	MLS	0.6	7.4	JPL-PTH → GSFC-ESDIS-PTH	3.1	85.7	85.8	Excellent	Ex
JPL → RSS	AMSR-E	0.5	2.5	JPL-PODAAC → RSS	2.57	3.69	4.40	Excellent	Ex
RSS → GHRC	AMSR-E	0.3		RSS (Comcast) → GHRC		3.57		Excellent	Ex
LaRC → JPL	TES, MISR	69.3	43.7	LARC-ASDC → JPL-TES	9.7	351.2		Excellent	Ex
JPL → LaRC	TES	1.5	4.4	JPL-PTH → LARC-PTH	1.0	62.9		Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT	31.3	60.5	GES DISC → LaRC ASDC	23.7	484.9	485.0	Excellent	Ex
LaRC → GSFC	CERES, MODIS, TES	0.4	0.2	LARC-ASDC → GES DISC	0.43	372.8	372.8	Excellent	Ex
JPL → NSIDC	AMSR-E	0.2	1.3	JPL-PODAAC → NSIDC		89.7		Excellent	Ex
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.6	0.5	NSIDC DAAC → GES DISC	1.56	197.8	197.8	Excellent	Ex
GSFC → NSIDC	MODIS, ICESAT, QuikScat	27.6	34.5	GES DISC → NSIDC-DAAC	11.1	115.8	117.8	Excellent	Ex
GHRC → NSIDC	AMSR-E	0.5	7.5	GHRC → NSIDC DAAC (ftp)		2.1		Excellent	Ex
LaRC → NCAR	MOPITT	0.1	5.4	LARC-ASDC → NCAR		289.6		Excellent	Ex
GSFC → LASP	ICESat, QuikScat	0.4	0.4	ESDIS-PTH → LASP (blue)	0.0018	9.00		Excellent	Ex
GSFC → JAXA	QuikScat, TRMM, AMSR	0.1	2.0	GSFC → JAXA	2.6	Testing discontinued: 31 March 2009		Excellent	Ex
JAXA → GSFC	AMSR-E	0.1	1.3	JAXA → GSFC	0.3			Excellent	Ex
GSFC → ERSDAC	ASTER	5.4	12.5	GSFC-EDOS → ERSDAC	3.5	77.2	78.6	Excellent	Ex
ERSDAC → EROS	ASTER	8.3	26.8	ERSDAC → EROS PTH	11.7	130.7	136.7	Excellent	Ex
GSFC → KNMI	OMI	0.03	3.3	GSFC-OMISIPS → KNMI ODPS	2.7	57.9	58.6	Excellent	Ex
				Significant change from v 1.4.2 (5/09) to v 1.4.3				Ratings Summary	
				Value used for ratings				HB 1.4.3 Req	
								Score	Prev
*Criteria:	Excellent	Total Kbps > Requirement * 3			Excellent		18	18	
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3			Good		1	1	
	Adequate	Requirement < Total Kbps < Requirement * 1.3			Adequate		0	0	
	Almost Adequate	Requirement / 1.3 < Total Kbps < Requirement			Almost Adequate		1	1	
	Low	Requirement / 3 < Total Kbps < Requirement / 1.3			Low		0	0	
	Bad	Total Kbps < Requirement / 3			Bad		0	0	
								Total Sites	20
								GPA	3.83
Notes:	Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS								

This graph shows a bar for each source-destination pair – relating the measurements to the requirements for that pair. The bottom of each bar represents the average measured user flow from the source site to the destination site (as a percent of the requirement) – it 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 67% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar similarly 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 **Almost Adequate**  
 ERSDAC→ EROS: Continued **Excellent**

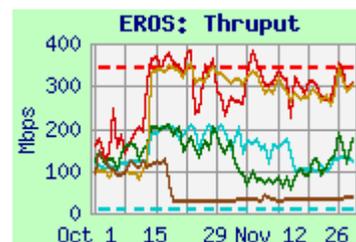
Web Page: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>  
[http://ensight.eos.nasa.gov/Organizations/production/EROS\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml)

**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	332.8	292.7	216.4	51.5	309.0
GSFC-EDOS → EROS LPDAAC	195.4	95.1	24.6		
GES DISC → EROS LPDAAC	357.3	307.1	206.2		
ERSDAC → EROS LPDAAC	191.8	130.7	66.8	11.7	136.7
NSIDC SIDADS → EROS PTH	46.7	33.8	26.5		
GSFC-ENPL → EROS PTH	723.2	547.6	351.8		
GSFC-NISN → EROS PTH	427.0	275.4	195.7		
LaRC PTH → EROS PTH	186.2	127.1	66.2		

**Requirements:**

Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08-11	343	Almost Adequate
ERSDAC → EROS	FY '06 -'10	8.3	Excellent



**Comments:**

**1.1 GSFC → EROS:** The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement, since that is the primary flow. The route is via the Doors to NISN SIP, via the NISN 10 gbps backbone to the NISN Chicago CIEF, then via GigE to the StarLight Gigapop, peering there with the EROS OC-48 tail circuit.

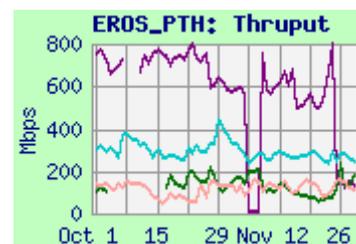
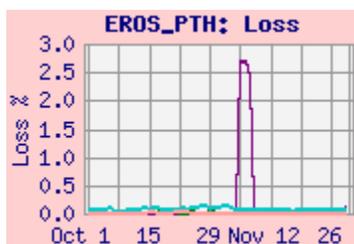
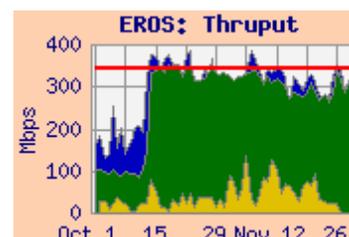
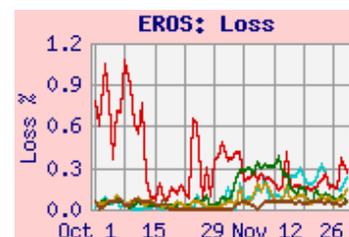
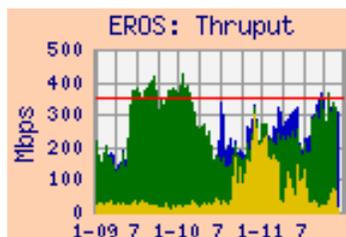
The user flow dropped off mid March '11, after about 5 months of high user flow, reportedly based on a science user at EROS acquiring MODIS data. This month it averaged only about 15% of the nominal requirement (the requirement includes MODIS reprocessing).

In August, thrupt from MODAPS-PDR to LPDAAC improved due to EBnet upgrades. The rating remains **Almost Adequate**.

Iperf performance from GSFC-NISN and GSFC-ENPL was mostly stable since mid May. The GSFC-ENPL host has a direct connection to the MAX; its route is via MAX to Internet2 to StarLight in Chicago.

**1.2 ERSDAC → EROS: Excellent**

See section 9 (ERSDAC) for further discussion.



**1.3 NSIDC → EROS-PTH:** Performance dropped in mid October – apparently due to switching routes at FRGP.

**1.4 LaRC → EROS:** The thrupt from LaRC-PTH to EROS-PTH was stable. The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources.

**2) to GSFC**

Ratings: NSIDC → GES DISC: Continued **Excellent**  
 LDAAC → GES DISC: Continued **Excellent**  
 JPL → GSFC: Continued **Excellent**

Web Pages:

- <http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>
- [http://ensight.eos.nasa.gov/Organizations/production/ESDIS\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtml)
- [http://ensight.eos.nasa.gov/Missions/icesat/GSFC\\_ISIPS.shtml](http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml)

**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
EROS LPDAAC → GES DISC	223.9	185.6	116.0	
EROS PTH → GSFC-ESDIS PTH	391.5	273.3	158.2	
JPL-PTH → GSFC-ESDIS PTH	88.2	85.7	80.5	3.1
LDAAC → GES DISC	490.1	372.8	223.6	0.43
LARC-ANGe → GSFC-ESDIS PTH	488.2	409.2	347.2	
NSIDC DAAC → GES DISC	225.9	197.8	131.8	1.56
NSIDC DAAC → GSFC-ISIPS	108.9	96.9	42.5	

**Requirements:**

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '10	0.6	Excellent
LDAAC → GES DISC	FY '07 – '10	0.4	Excellent
JPL → GSFC combined	CY '06 – 10	3.2	Excellent

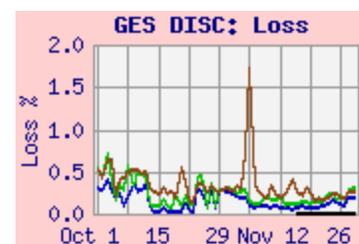
**Comments:** Thruput to GES DISC was noisy but relatively stable this month, similar to last month.

**EROS, EROS-PTH → GSFC:** The thruput for tests from EROS and EROS-PTH to GES DISC and ESDIS-PTH were mostly stable, with better results from EROS-PTH.

**JPL → GSFC:** Thruput from JPL-PTH was again very stable this month. With the modest requirement (reduced from 7.4 mbps in May '09), the rating remains "Excellent". The actual user flow is consistent with the reduced requirement.

**LaRC → GSFC:** Performance from LDAAC to GES DISC and LaRC ANGe to ESDIS-PTH remained way above 3 x the modest requirement, so the rating continues as "Excellent". The user flow this month was very close to the requirement.

**NSIDC → GSFC:** Performance from NSIDC to GSFC (DAAC and ISIPS) was mostly steady this month, after dropping in mid October, apparently due to switching routes at FRGP. The user flow was above the low requirement (reduced from 13.3 mbps in May '09); the rating remains "Excellent".

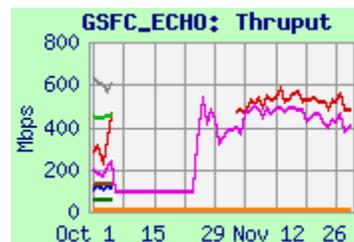


## 2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: [http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC\\_ECHO.shtml](http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_ECHO.shtml)

### Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	n/a	n/a	n/a
EROS LPDAAC ftp	11.9	11.8	10.5
GES DISC	590.6	521.9	366.2
GES DISC ftp	528.1	460.8	279.5
LaRC ASDC DAAC	n/a	n/a	n/a
LaRC ASDC DAAC ftp	n/a	n/a	n/a
MODIS-LADSWEB	n/a	n/a	n/a
NSIDC DAAC	n/a	n/a	n/a
NSIDC DAAC ftp	11.2	10.4	7.2



### Comments:

The echo node was moved at the end of September. Most ftp tests continued working (except from LaRC ASDC), but iperf tests need new firewall rules before resumption of testing. Iperf testing resumed from GES DISC in November, with excellent thruput.

Ftp performance was stable from EROS and NSIDC, but initially dropped from GES DISC, then improved in late October with further reconfiguration. FTP performance is mostly limited by TCP window size – especially on ftps with long RTT.

## 2.3 GSFC-EMS: EOS Metrics System

Web Page: [http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC\\_EMS.shtml](http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_EMS.shtml)

### Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS-PTH	85.8	77.4	19.8
ESDIS-PTH	938.3	937.1	918.4
GES DISC	567.3	457.7	198.3
LARC-PTH	94.0	93.9	27.9
MODAPS-PDR	836.0	745.6	526.2
NSIDC-SIDADS	92.3	89.5	40.3



### Comments:

Testing is performed to GSFC-EMS from the above nodes, iperf only. The EMS testing from ESDIS-PTH, GES DISC, and MODAPS-PDR was transitioned to the new test node (FS1) in November, with much improved thruput. NSIDC-SIDADS will be transitioned next month; waiting on firewall rules to transition EROS-PTH and LARC-PTH. Performance limitation to the old server was its 100 mbps Fast-E connection; the new server is gigabit connected.

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/aqua/JPL_AIRS.shtml)  
[http://ensight.eos.nasa.gov/Missions/aura/JPL\\_MLS.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_QSCAT.shtml)  
[http://ensight.eos.nasa.gov/Organizations/production/JPL\\_PODAAC.shtml](http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml)

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-GES DISC → JPL-AIRS	211.8	172.4	97.8	41.2	177.9
GSFC-NISN → JPL-AIRS	292.7	273.5	240.0		
ESDIS-PTH → JPL-AIRS	234.1	188.8	141.5		
ESDIS-PTH → JPL-PODAAC	111.7	92.1	63.8		
MODAPS-PDR → JPL-PODAAC	40.8	28.6	16.2		
GSFC-NISN → JPL-QSCAT	86.9	82.7	70.3		
ESDIS-PS → JPL-QSCAT	89.2	70.0	39.3		
GSFC-NISN → JPL-MLS	307.3	249.2	150.7		
ESDIS-PTH → JPL-MLS	238.9	185.2	111.2		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	FY '08-'10	101.7	Good
GSFC → JPL AIRS	FY '08-'10	98	Good
GSFC → JPL PODAAC	FY '08-'11	1.5	Excellent
GSFC → JPL QSCAT	FY '08-'11	0.6	Excellent
GSFC → JPL MLS	FY '08-'10	2.1	Excellent

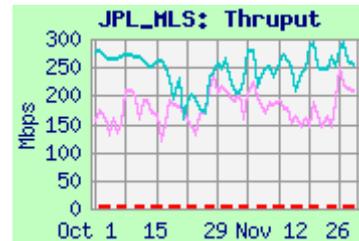
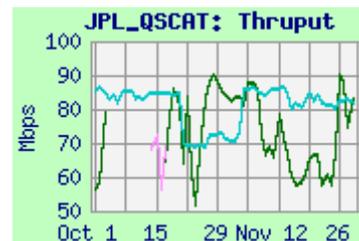
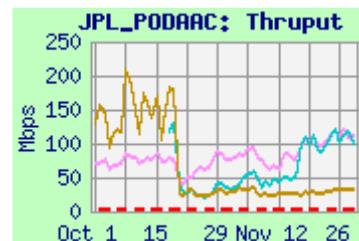
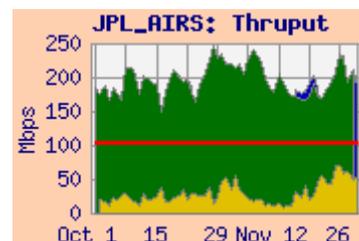
**Comments:** The user flow from GSFC/EOS to JPL combined was back near normal this month.

**AIRS, Overall:** Integrated thrupt from **GES DISC** remained well above 30% over 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 thrupt is also remains above 1.3 x this requirement, so the overall rating also remains **Good**.

**PODAAC:** The PODAAC node was switched in May – testing to the new node began mid May, but failed in late August, and was fixed in mid October. Performance is lower than to the old node, but is still way above the 1.5 mbps PODAAC requirement, rating **Excellent**.

**QSCAT:** Thuput from ESDIS-PS (replacing ESDIS-PTH) to QSCAT is similar to GSFC-NISN, and remains well above the modest requirement, rating **Excellent**.

**MLS:** Thrupt from ESDIS-PTH was mostly stable, but thrupt was better from GSFC-NISN. The rating remains **Excellent**.



**3.2) LaRC → JPL**

Rating: Continued **Excellent**

Web Pages:

- [http://ensight.eos.nasa.gov/Organizations/production/JPL\\_TES.shtml](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/Missions/terra/JPL_MISR.shtml)
- [http://ensight.eos.nasa.gov/Organizations/production/JPL\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml)

**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
LaRC DAAC → JPL-TES	449.4	351.2	151.1	0.08	351.2
LaRC PTH → JPL-TES	170.7	146.8	115.0		
LaRC PTH → JPL-TES sftp	3.08	3.07	3.01		
GSFC-NISN → JPL-TES sftp	3.18	3.17	3.14		
LaRC ANGE → JPL-PTH	78.3	74.7	72.1	9.7	74.8
LaRC PTH → JPL-PTH	65.9	46.5	27.1		
LaRC PTH → JPL-PTH sftp	31.8	31.8	31.8		
LaRC DAAC → JPL-MISR	58.4	53.7	32.5	0.5	53.7
LaRC PTH → JPL-MISR	59.9	53.0	35.3		

**Requirements:**

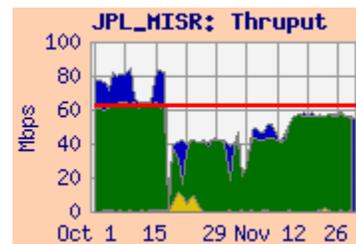
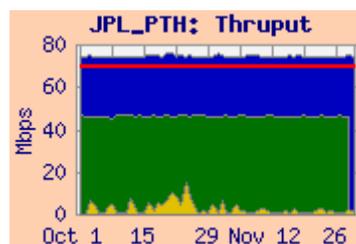
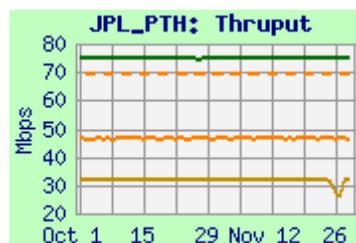
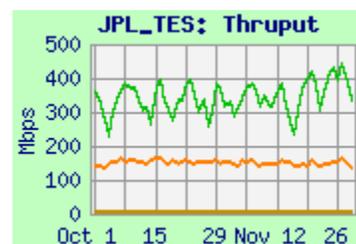
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 –	7.0	Excellent
LaRC DAAC → JPL-MISR	FY '07 –	62.3	Almost Adequate
LaRC → JPL-Combined	FY '07 –	69.3	Excellent

**Note:** The overall LaRC → JPL flow (9.7 mbps) was below last month's exceptionally high 15.4 mbps. Only about 5% of the LaRC to JPL flow this month was for MISR (previously around 80%). The JPL-PTH integrated graph shows the overall LaRC to JPL user flow (vs. the overall requirement).

**LaRC → JPL (Overall, TES):** Median performance from LaRC ASDC DAAC to JPL-TES remains well over 3 x the TES and combined requirements, so the TES and Overall ratings remain "Excellent". User flow to TES is very low.

**Sftp performance** from LaRC-PTH to JPL-TES is quite low, apparently limited by the Sftp server on the TES node. An additional Sftp test to JPL-TES from GSFC-NISN (not graphed) gets similar poor results to LaRC-PTH. The Sftp window size on the new TES node is quite large, and is thus not the problem. Instead, it appears that the TES sftp application is throttling the sender. Note that Sftp results are much better from LaRC-PTH to JPL-PTH (than to TES), even though iperf results from the same source are better to TES than JPL-PTH.

**LaRC → JPL (MISR):** The MISR node was replaced in mid October – the throughput is lower than with the old node – will be retuned. It remains BELOW the new requirement, so the MISR rating remains Almost Adequate. The average user flow to MISR was only about 0.8% of the new requirement.



**3.3) JPL → LaRC**Rating: Continued **Excellent**Web Page: [http://ensight.eos.nasa.gov/Organizations/production/LARC\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml)**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
JPL-PTH → LaRC PTH	63.1	62.9	62.6	1.0	62.9

**Requirements:**

Source → Dest	Date	Mbps	Rating
JPL-PTH → LaRC PTH	FY '07 – '10	1.5	<b>Excellent</b>

**Comment:** This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving; it was reduced from 4.4 mbps in May '09 (and had been reduced in April '08 from 52.6 mbps). This month the thrupt was again stable at the lower of its two common states – 63 and 85 mbps. The rating remains “**Excellent**”. The small user flow was consistent with the requirement.

**4) 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](http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml)  
[http://ensight.eos.nasa.gov/Organizations/production/LARC\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml)

**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LaRC ASDC	542.7	484.9	355.9	23.7	485.0
GSFC-EDOS → LaRC ASDC	506.0	321.2	91.1		
ESDIS-PTH → LaRC-ANGe	436.4	396.0	301.8		
GSFC-NISN → LaTIS	458.8	435.7	401.4		

**Requirements:**

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '09 – '11	31.3	<b>Excellent</b>

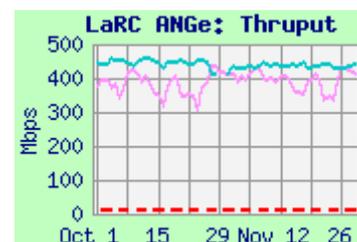
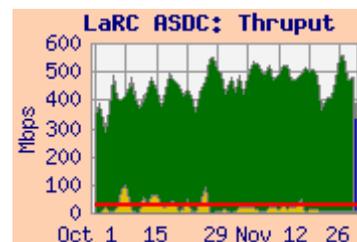
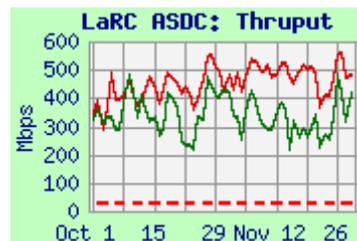
**Comments:**

**GSFC → LaRC ASDC:** The rating is based on the **GES DISC** to LaRC ASDC DAAC thrupt, compared to the combined requirement. The integrated thrupt increased in August, due to disabling of TSO on **GES DISC**. It remains well above 3 x this requirement, so the rating remains “**Excellent**”.

Thruput to ASDC from **GSFC-EDOS** was much lower than from **GES DISC** until it was returned in mid August, with improved results.

As seen on the integrated graph, the user flow was variable, fairly consistent the requirement.

**ANGe (LaTIS):** Testing to ANGe from **ESDIS-PTH** gets steady performance. Testing to LaTIS (Darrin) from **GSFC-NISN** was similar, with very consistent results.



5) Boulder CO sites:

5.1) NSIDC:

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

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml>  
[http://ensight.eos.nasa.gov/Organizations/production/NSIDC\\_SIDADS.shtml](http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml)  
[http://ensight.eos.nasa.gov/Organizations/production/NSIDC\\_PTH.shtml](http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml)

The NSIDC DAAC was disconnected from NISN PIP in December '09 – all flows now go via the UCB campus, usually via FRGP to Internet2 or NLR. Thus the DAAC competes with the students for network capacity, and there was often significant diurnal variation.

NSIDC reports that the circuit from UCB to FRGP was increased from 1 gbps to 10 gbps on approx 10 July. No performance change was observed at that time, however. Performance did improve a bit at the end of July, but dropped again in October.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES-DISC → NSIDC DAAC	138.1	115.8	73.9	11.1	117.8
MODAPS-PDR → NSIDC DAAC	52.0	38.8	27.4		
GSFC-EDOS → NSIDC DAAC	120.9	59.7	14.5		
GSFC-ISIPS → NSIDC (iperf)	98.5	83.2	64.7		
JPL PODAAC → NSIDC DAAC	94.6	89.7	76.3		

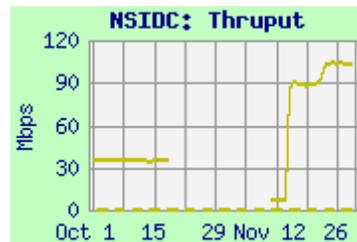
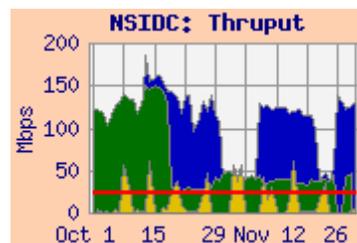
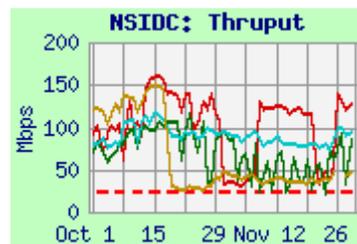
Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '10	27.6	Excellent
JPL → NSIDC	CY '07 – '10	0.2	Excellent
GHRC → NSIDC	CY '07 – '10	0.5	Excellent

**Comments: GSFC → NSIDC S4PA:** This rating is based on testing from the GES DISC server to the NSIDC DAAC. The requirement was reduced in May '09 from 34.5 mbps (and was 64 mbps in April '08). Thruput from GES DISC to NSIDC improved in August due to EBnet upgrades, but dropped in late-October, after a reboot which re-enabled TSO, then improved again in November when TSO was again disabled. Thruput from MODAPS-PDR also dropped in mid-October, but did not recover – apparently due to switching routes at FRGP.

The integrated thruput from GES DISC remains above the requirement, by more than 3x, so the rating remains “Excellent”. The user flow was a bit higher than last month’s 9.3 mbps, at about 40% of the reduced requirement. Testing from other GSFC sources, including EDOS, and ISIPS, is similar to GES DISC.

**JPL PODAAC → NSIDC S4PA:** The requirement was reduced from 1.34 mbps in May '09. Thruput from PODAAC to NSIDC has been mostly stable with a similar diurnal cycle since testing was moved to use Internet2 in September '09; the rating remains “Excellent”. Testing was discontinued when the PODAAC node was replaced in mid October, but was resumed in November, with improved performance after retuning.



5) Boulder CO sites (Continued):

5.1) NSIDC: (Continued): Test Results: GHRC to NSIDC

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GHRC → NSIDC DAAC (nuttcp)	9.99	6.83	3.51
GHRC → NSIDC DAAC (ftp pull)	3.09	2.05	1.38



**GHRC, GHRC-ftp → NSIDC S4PA:** GHRC (NSSTC, UAH, Huntsville, AL) sends AMSR-E data to NSIDC via NLR / Internet2. The rating is based on reverse nuttcp testing. The median nuttcp thrupt is more than 3x the 0.5 mbps requirement, so the rating remains “**Excellent**”.

Performance dropped in mid October (nuttcp: small drop, ftp: big drop), apparently due to switching routes at FRGP.

Test Results: NSIDC SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	245.2	222.1	151.0
GSFC-NISN → NSIDC-SIDADS	115.6	108.1	97.5
ESDIS-PTH → NSIDC-PTH	81.8	77.2	67.8
MODAPS-PDR → NSIDC-PTH	44.3	34.7	23.4
JPL PTH → NSIDC-PTH	81.7	61.5	41.4



**GSFC → NSIDC-SIDADS:** Thruput via Internet2 to SIDADS from ENPL and GSFC-NISN improved with retuning.

**NSIDC-PTH:** Thruput to NSIDC-PTH from MODAPS-PDR dropped in mid October – apparently due to switching routes at FRGP. Performance from JPL PTH was very steady. Performance from ESDIS-PTH improved in late October due to retuning.



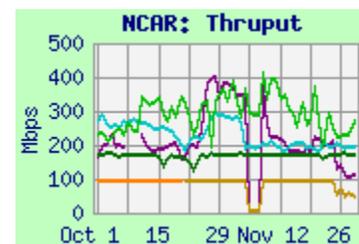
5.2) NCAR:

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

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

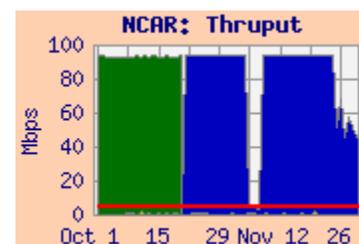
Test Results:

Source	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
LaRC ASDC	430.4	289.6	181.7	0.1
LaRC PTH	182.5	171.2	139.4	
GSFC-ENPL-GE	296.2	193.7	111.6	n/a
GSFC-ENPL-FE	94.1	94.0	93.2	
GSFC-NISN	299.0	196.2	160.4	



**Comments:** NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements.

**From LaRC:** Thruput from LaRC ASDC was much less noisy (2.4:1 best : worst ratio, vs. 18:1 in September), and the median (also daily worst) remained well above 3 x the modest requirement, so the rating remains “**Excellent**”. Thruput from LaRC-PTH is lower but much steadier, so the inference is that the congestion was isolated to the ASDC DAAC.



**From GSFC:** From GSFC-NISN, the route is via NISN to the MAX (similar route and performance as from LaRC). From GSFC-ENPL-GE, with a Gig-E interface, and a 10 gig connection to MAX, the median thrupt was comparable. Performance from all sources is somewhat noisy but mostly stable. The average user flow from GSFC this month was 0.42 mbps, typical of recent months.

**5) Boulder CO sites (Continued):****5.3) LASP:**Ratings: GSFC → LASP: Continued **Excellent**Web Page: <http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml>**Test Results:**

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (iperf)	9.16	9.00	8.08
ESDIS-PTH → LASP blue (scp)	3.79	3.65	3.02
GSFC ENPL → LASP green	55.6	38.8	26.1
LASP → GES DISC	9.34	9.34	8.43

**Requirement:**

Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 →	0.016	<b>Excellent</b>

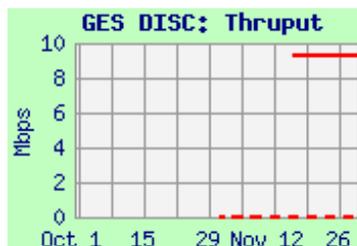
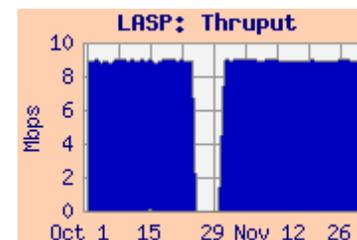
**Comments:** In January '11, LASP's connection to NISN PIP was rerouted: it previously was 100 mbps from CU-ITS via NSIDC; this was changed to a 10 mbps connection to the NISN POP in Denver.

Thruput was consistent with the new circuit limitation. Testing from EDOS was discontinued in September due to no longer having a requirement.

Testing was added from LASP and GES DISC as there is a requirement for the SORCE mission for this flow. The median thruput from LASP to GES DISC was well over 3x the requirement, so the rating remains "**Excellent**".

The average user flow from GSFC to LASP this month was above normal at 1.8 kbps. It is planned to measure the user flow from LASP to GES DISC next month.

Performance from GSFC-ENPL to a node on LASP's green network via Internet2 / UCB was much higher, but dropped in mid October – apparently due to switching routes at FRGP.

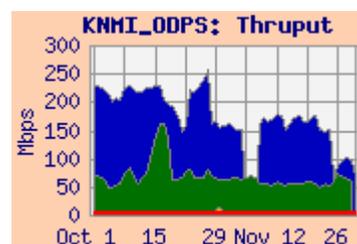
**6) KNMI:**Rating: Continued **Excellent**Web Pages [http://ensight.eos.nasa.gov/Missions/aura/KNMI\\_ODPS.shtml](http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml)**Test Results:**

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
OMISIPS → KNMI-ODPS	78.6	57.9	40.7	0.03
GSFC-ENPL → KNMI-ODPS	186.0	154.0	113.3	

**Comments:** 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 at KNMI. The thruput decreased in mid August, but remained much more than the tiny requirement, so the rating remains "**Excellent**". Thruput was higher from GSFC-ENPL (outside the ESDIS firewall).

The user flow averaged 2.7 mbps this month, (hard to see on the integrated graph). This is consistent with the previous 3.3 mbps requirement, but is much more than the current 0.03 mbps requirement (This new requirement remains under review). The rating would still be "**Excellent**" compared with a requirement of 3.3 mbps.



**7) Remote Sensing Systems (RSS):** Ratings: JPL → RSS: Continued **Excellent**  
 RSS → GHRC: Continued **Excellent**

Web Page <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>

**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integ.	Req
	Best	Median	Worst			
JPL → RSS (NISN)	5.51	3.69	0.98	2.57	4.40	0.49
JPL → RSS (Comcast)	20.3	19.8	19.1			
RSS (Comcast) → GHRC (UAH)	4.40	3.54	2.69			0.34
RSS (Comcast) → GHRC (NISN)	4.14	3.57	2.92			

**Comments:** RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving L1 data from JAXA via JPL, and sending its processed L2 results to GHRC (aka NSSTC) (UAH, Huntsville, AL).

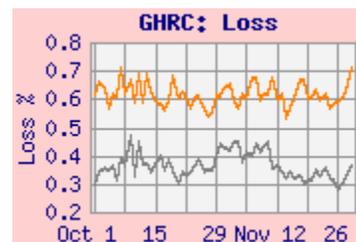
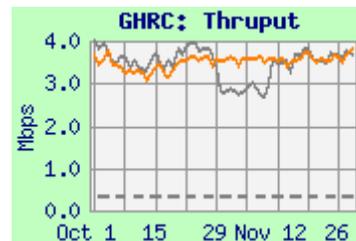
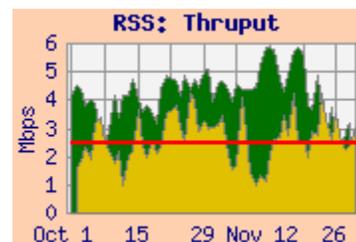
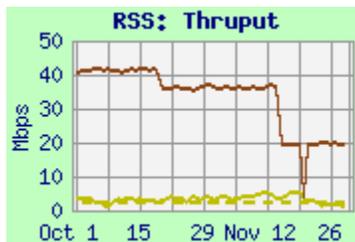
RSS currently is using a NISN SIP circuit: 4 x T1s to NASA ARC (total 6 mbps). User flow data on this circuit is being obtained from the NISN SIP router at ARC.

The integrated graphs show that periods of low iperf performance are attributable to higher user flow. The requirement was reduced with handbook 1.4.3 (was 2.5 mbps previously). The median iperf was more than 3 x the reduced requirement, so the rating remains “**Excellent**”.

In April '11, a new Comcast circuit was installed, rated at 50 mbps incoming, and 12 mbps outgoing. Testing from JPL began on this circuit in April, with results consistent with the specs, as shown above.

**RSS → GHRC:** In addition, the new server at RSS connected to the Comcast circuit allows “3<sup>rd</sup> party testing”, as does the server at GHRC. Testing has therefore been initiated from RSS to GHRC, with results around 4 mbps, both to a UAH address and a NISN address at GHRC. Either result yields a rating of “**Excellent**” re the 0.34 mbps requirement.

Plans are being developed to switch the production flows to the Comcast circuit by the end of CY '11, leading to the removal of the T1s.



**8) ERSDAC:**

Ratings: **GSFC → ERSDAC:** Continued **Excellent**  
**ERSDAC → EROS:** Continued **Excellent**  
**ERSDAC → JPL-ASTER-IST:** Continued **Excellent**

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

**US ↔ ERSDAC Test Results**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → ERSDAC	95.5	77.2	9.5	3.5	78.6
GES DISC → ERSDAC	48.3	39.8	27.0		
GSFC ENPL (FE) → ERSDAC	82.8	79.6	79.1		
GSFC ENPL (GE) → ERSDAC	618.1	531.7	282.6		
ERSDAC → EROS	191.8	130.7	66.8	11.7	136.7
ERSDAC → JPL-ASTER IST	68.1	64.0	53.6		

Requirements:

Source → Dest	FY	Mbps	Rating
GSFC → ERSDAC	'05 - '09	5.4	Excellent
ERSDAC → JPL-ASTER IST	'07- '09	0.31	Excellent
ERSDAC → EROS	'07- '09	8.3	Excellent

**Comments:**

**GSFC → ERSDAC:** As of approximately 1 September '11, the ERSDAC test node is now connected at 1 gbps – formerly was 100 mbps. The median thrupt from most nodes improved. A new test from GSFC ENPL was able to get average thrupt over 500 mbps. However, some nodes have been using QoS (HTB) to reduce loss previously seen in the 1 gig to 100 meg switch at Tokyo-XP – those nodes remain limited by their HTB settings, and did not see much improvement.

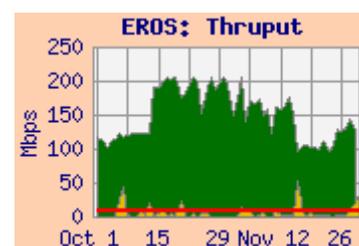
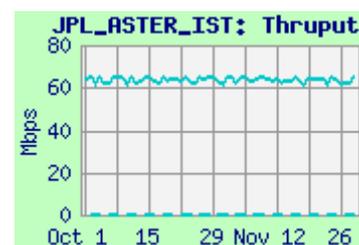
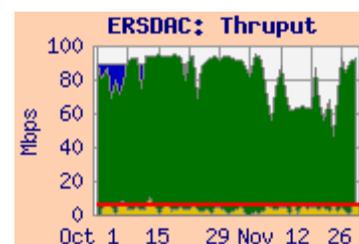
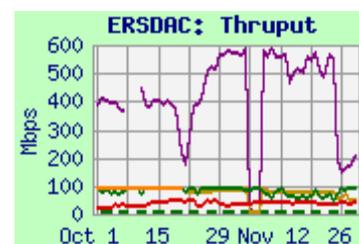
Performance from EDOS is now limited by HTB. Thrupt remains well above 3 x the reduced requirement; the rating remains “Excellent”. The integrated chart shows that the user flow is stable, and consistent with the new requirement.

Thrupt from GES DISC to ERSDAC did not improve. It had been thought to be limited by packet loss at the GigE to FastE switch at Tokyo-XP, but as that limitation has been eliminated, another culprit must be identified. It now seems likely that the problem is closer to GSFC, perhaps within EBnet – since GES DISC has high loss to several destinations. This configuration is planned to be upgraded soon.

The FastE connected GSFC-ENPL-FE node is limited to 100 mbps by its own interface, and gets steady thrupt.

**ERSDAC → JPL-ASTER-IST:** The median thrupt dropped a bit with the ERSDAC Gig-E upgrade (possibly due to a similar burst overload situation), but remains well above the [unstated] requirement (IST requirements are generally 311 kbps), so the rating remains “Excellent”.

**ERSDAC → EROS:** The thrupt improved with retuning (again) in mid October, after the ERSDAC Gig-E upgrade; it remains well above the reduced requirement (was 26.8 mbps previously). The new 8.3 mbps requirement is much closer to the actual flow user flow (which was higher than normal this month). The median thrupt is more than 3 x the reduced requirement, so the rating remains “Excellent”.



**9) US ↔ JAXA**

Ratings: **US → JAXA: Continued Excellent**  
**JAXA → US: Continued Excellent**

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009 (the end of the Japanese government’s fiscal year). No additional testing is planned for AMSR or TRMM. All testing to JAXA-TKSC for ALOS was terminated at the end of June ‘09.

However, the user flow between GSFC and JAXA continues to be measured. As shown below, the user flow this month averaged 2.65 mbps from GSFC to JAXA (with several peak periods above 5 mbps), and 85 kbps from JAXA to GSFC (with peaks above 300 kbps). Comparing these values to the new requirement of 0.1 mbps produces a rating of “Excellent” in both directions. Note that the user flow to JAXA is much more consistent with the old 2.0 mbps GSFC → JAXA requirement.

