

EOS Production Sites Network Performance Report: June 2014

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:

- **Very stable flows**
 - **GPA: 3.88** ↑ **New All-time High!** (was 3.84 last 2 months)
 - Same as last 2 months except that MODIS reprocessing flow to EROS (also NSIDC) is now considered individually by month – since it's not flowing this month, the EROS requirement is much lower.
- **Requirements:** updated to the Network Requirements Database for 2014
 - Previously used 2012 values
 - New requirements include GPM, SMAP, and OCO2 missions
 - SMAP requirements begin in FY15
 - AMSR-E not producing further data:
 - RSS: AMSR-E Requirements from JPL and to GHRC removed
 - Removed AMSR-E from JPL to NSIDC
 - JPL to NSIDC requirements resume in FY '15 for SMAP
- **All flows rated **Good** or **Excellent** !!!**

Ratings Changes:

Upgrade: ↑: GSFC → EROS: **Good** → **Excellent**

Due to no MODIS reprocessing requirement this month

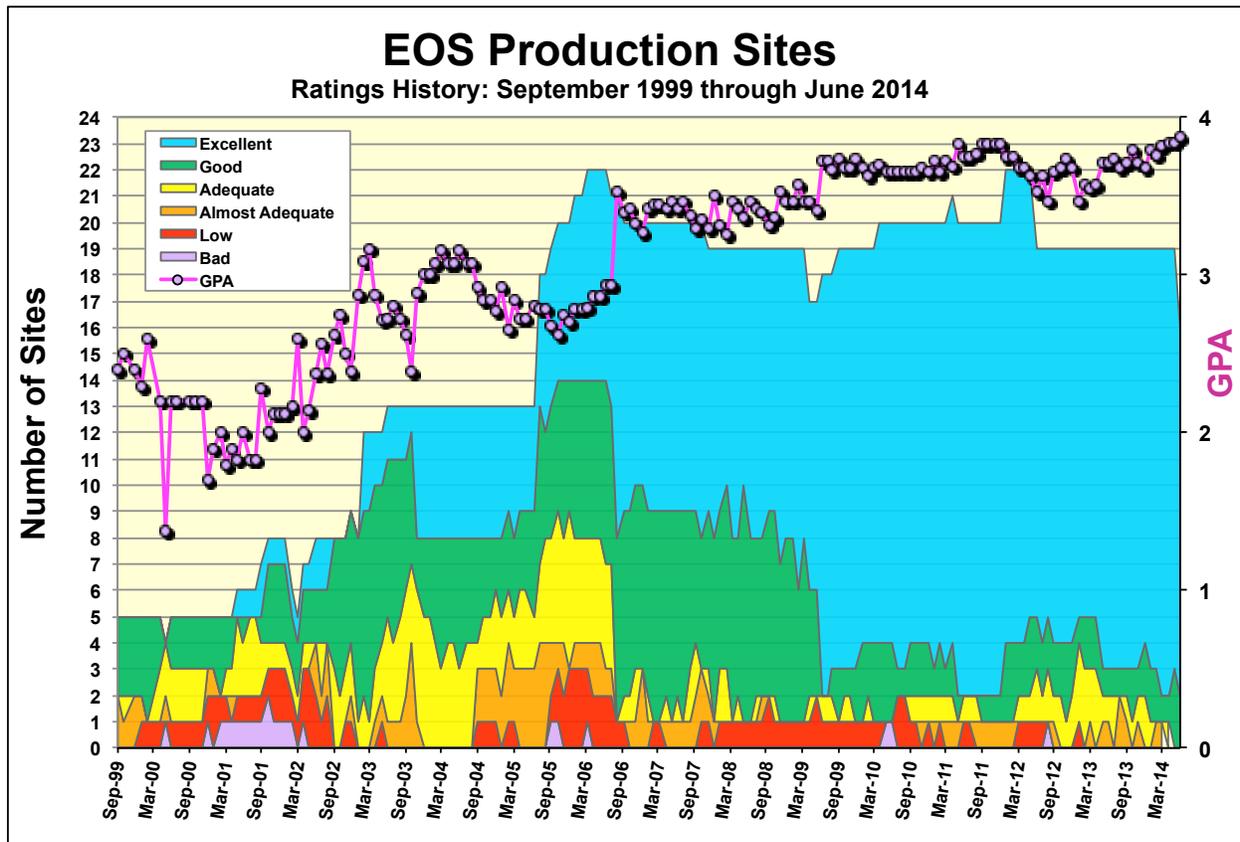
Downgrades: ↓: None

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 / 1.5 < Total Kbps < Requirement
Low:	1	Requirement / 3 < Total Kbps < Requirement / 1.5
Bad:	0	Total Kbps < Requirement / 3

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

Note that “**Almost Adequate**” implies meeting the requirement excluding the usual 50% contingency factor.

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
- 2012 January: Added NOAA → GSFC-SD3E
Added GSFC-SD3E → Wisconsin
- 2012 June: Deleted GSFC → LASP
Deleted GSFC ← → JAXA
- 2014 June: AMSR-E no longer producing data
Deleted JPL to RSS and RSS to GHRC
Deleted JPL to NSIDC
JPL to NSIDC requirements resume in FY '15 for SMAP

Requirements Basis:

This month, the requirements were updated to the latest values in the database!

- Added missions GPM, OCO2, and SMAP missions (SMAP effective FY '15)
- Removed AMSR-E, ICESAT flows
- MODIS reprocessing incorporated month-by-month
 - No reprocessing until 2014 August

In June 2012, the requirements were switched, as had been planned for quite a while, to use the EOSDIS network requirements database.

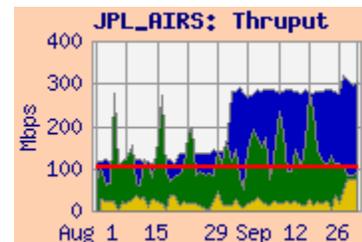
Previously, the requirements were based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Prior to that, the requirements were derived from version 1.4.2.

One main difference between Handbooks 1.4.2 and 1.4.3 is that in 1.4.3 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.

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”.



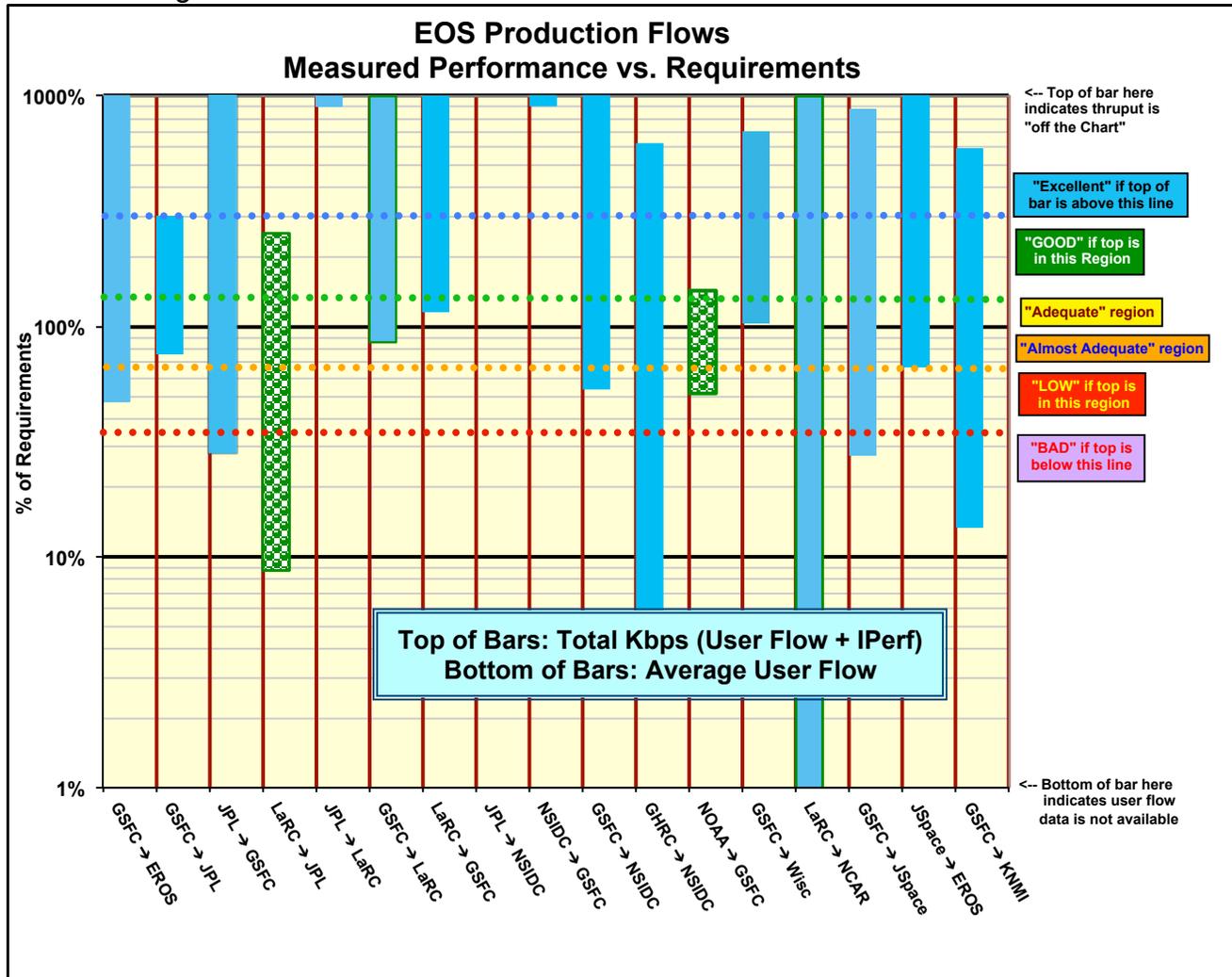
The green area is stacked on top of the user flow, and represents the “adjusted” daily average iperf thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments 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

June 2014		Requirements (mbps)		Testing				Ratings		
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re FY '14 Requirements		
		FY '14	FY '12					This Month	Last Month	
GSFC → EROS	MODIS, LandSat	49.8	548.4	MODAPS-PDR → EROS LPDAAC	23.6	757.0	757.0	Excellent	Good	
GSFC → JPL	AIRS, MLS, NPP, TES, OCO2, SMAP	114.8	63.0	NPP SD3E OPS1 → JPL-AIRS	87.0	306.8	346.5	Excellent	Ex	
JPL → GSFC	MLS, OCO2	11.9	0.57	JPL-PODAAC → GSFC GES DISC	3.4	482.7	483.2	Excellent	Ex	
LaRC → JPL	TES, MISR	83.5	83.5	LARC-ASDC → JPL-TES	7.3	212.2		Good	Good	
JPL → LaRC	TES	1.1	1.1	JPL-TES → LARC-PTH	21.6	157.9		Excellent	Ex	
GSFC → LaRC	CERES, MISR, MOPITT, TES, MODIS	60.7	52.2	GSFC EDOS → LaRC ASDC	51.9	882.2	882.2	Excellent	Ex	
LaRC → GSFC	MISR	0.6	0.6	LARC-ASDC → GES DISC	0.70	934.3	934.3	Excellent	Ex	
JPL → NSIDC	AMSR-E, SMAP	0	0.16	JPL-PODAAC → NSIDC		524.8		n/a	Ex	
NSIDC → GSFC	AMSR-E, MODIS, ICESAT	0.009	0.017	NSIDC DAAC → GES DISC	1.40	786.4	786.5	Excellent	Ex	
GSFC → NSIDC	AMSR-E, MODIS, ICESAT	1.1	8.4	MODAPS PDR → NSIDC-DAAC	9.4	565.0	565.0	Excellent	Ex	
GHRC → NSIDC	AMSR-E	2.08	0.5	GHRC → NSIDC DAAC	0.09	13.0	13.0	Excellent	Ex	
NOAA → GSFC	NPP	601.3	522.3	NOAA-PTH → GSFC NPP-SD3E OPS1	308.7	796.6	862.1	Good	Good	
GSFC → Wisc	NPP, MODIS, CERES, AIRS	264.2	259.1	GSFC NPP-SD3E OPS1 → WISC	273.6	1828.1	1849.8	Excellent	Ex	
LaRC → NCAR	MOPITT	0.044	0.044	LaRC-PTH → NCAR		146.2		Excellent	Ex	
GSFC → JAXA	TRMM, AMSR-E, MODIS, GPM	15.4	3.5	GSFC-EBnet → JAXA	9.6	n/a		n/a	n/a	
JAXA → GSFC	AMSR-E, GPM	3.3	0.16	JAXA → GSFC-EBnet	2.05	n/a		n/a	n/a	
GSFC → JSpace	ASTER	16.4	6.8	GSFC-EDOS → JSpace-ERSD	4.54	143.7	143.7	Excellent	Ex	
JSpace → EROS	ASTER	8.3	8.3	JSpace-ERSD → EROS PTH	5.57	297.0	297.0	Excellent	Ex	
GSFC → KNMI	OMI	13.4	13.4	GSFC-OMISIPS → KNMI ODPS	1.79	79.1	79.1	Excellent	Ex	
		Significant change from FY '12 to FY '14								
					Value used for ratings					
							Ratings Summary		FY '14 Req	
									Score	Prev
*Criteria:	Excellent	Total Kbps > Requirement * 3					Excellent	14	16	
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3					Good	2	3	
	Adequate	Requirement < Total Kbps < Requirement * 1.3					Adequate	0	0	
	Almost Adequate	Requirement / 1.5 < Total Kbps < Requirement					Almost Adequate	0	0	
	Low	Requirement / 3 < Total Kbps < Requirement / 1.5					Low	0	0	
	Bad	Total Kbps < Requirement / 3					Bad	0	0	
							Total Sites		16	19
Notes:	Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS, NPP, GPM, SMAP, OCO2					GPA		3.88	3.84	

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 (when available) is used to determine the ratings.



1) EROS:

Ratings: GSFC → EROS: **↑ Good** → **Excellent**
 ERSDAC → EROS: Continued **Excellent**

Web Pages: <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)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	853.8	757.0	452.1	23.6	757.0
GSFC-EDOS → EROS LPDAAC	426.3	414.5	25.8		
GES DISC → EROS LPDAAC	646.8	606.9	389.7		
GSFC-ENPL → EROS LPDAAC	880.0	872.0	835.0		
JSpace-ERSD → EROS LPDAAC	312.9	297.0	165.3	5.6	297.0
NSIDC SIDADS → EROS PTH	920.2	914.9	850.1		
GSFC-ENPL → EROS PTH	2290.0	2250.0	2120.0		
GSFC-ENPL → EROS PTH (IPv6)	n/a	n/a	n/a		
GSFC-NISN → EROS PTH	825.5	673.0	285.0		
ESDIS-PS → EROS PTH	834.5	689.2	306.9		
LaRC PTH → EROS PTH	162.1	149.6	95.6		

Requirements:

Source → Dest	Date	mbps	prev	Rating
GSFC → EROS	6/14	49.8	548.4	↑ Excellent
ERSDAC → EROS	FY '06 –	8.3	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. **There is no reprocessing flow requirement this month, so the requirement is only 49.8 mbps (apparently will increase to 1016.1 mbps in August).** The average user flow this month was stable, and about 70% of the requirement without reprocessing or contingency.

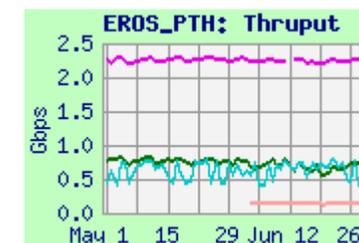
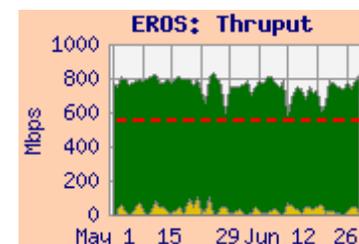
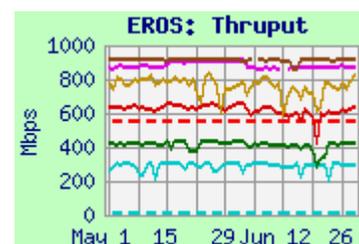
Thruput from all sources was mostly stable this month. The median integrated thrupt from **MODAPS-PDR** to LPDAAC was more than 3 x the non-reprocessing requirement, **so the rating improves to Excellent**. The median thrupt from **GSFC-EDOS** and **GES DISC** (also on EBnet) was also stable. The route from EBnet sources is via the Doors, to the NISN 10 gbps backbone, to the NISN Chicago CIEF, then via a NISN GigE, peering at the StarLight Gigapop with the EROS OC-48 tail circuit.

Iperf testing for comparison is performed from **GSFC-ENPL** to both LPDAAC (the “FTL” node, outside the EROS firewall) and to EROS-PTH (both 10 gig hosts). The route from **GSFC-ENPL** to EROS is from GSFC via a direct 10 gig connection to the MAX, to Internet2, to StarLight in Chicago. **GSFC-ENPL** (IPv4) to EROS-PTH now typically gets over 2 gbps. This shows that the capacity of this network is well in excess of the requirement – it would be rated **Excellent**. **GSFC-ENPL IPv6** tests have been failing since February..

1.2 JSpace-ERSD → EROS: **Excellent**. See section 9 (ERSD) for further discussion.

1.3 NSIDC → EROS-PTH: Performance was also stable this month.

1.4 LaRC → EROS-PTH: Testing from **LaRC-PTH** to EROS-PTH was restored in June (had been failing since April). The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources. Performance is consistent with the **LaRC-PTH** 200 mbps outflow limitation.



2) to GSFC**2.1) to NPP, GES DISC, etc.**Ratings: NOAA → NPP SD3E: Continued **Good**NSIDC → GES DISC: Continued **Excellent**LDAAC → GES DISC: Continued **Excellent**JPL → GSFC: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Missions/NPP/GSFC_SD3E.shtml<http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtmlhttp://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NOAA-PTH → NPP-SD3E-OPS1	829.5	796.6	710.6	308.7	862.1
EROS LPDAAC → GES DISC	261.0	229.8	142.1		
EROS PTH → GSFC-ESDIS PTH	924.5	802.5	179.0		
JPL-PODAAC → GES DISC	772.5	482.7	183.8	3.4	
JPL-TES → GSFC-NISN	690.5	432.1	218.0		
LaRC ASDC → GES DISC	936.2	934.3	869.0	0.7	
LARC-ANGe → GSFC-ESDIS PTH	933.9	889.9	841.8		
NSIDC DAAC → GES DISC	845.8	786.4	633.7	1.4	
NSIDC DAAC → GSFC-ISIPS (scp)	31.6	31.0	24.0		

Requirements:

Source → Dest	Date	FY '14	FY '12	Rating
NSIDC → GSFC	FY '14 –	0.009	0.017	Excellent
LaRC ASDC → GES DISC	CY '12 –	0.6	0.6	Excellent
JPL → GSFC combined	FY '14 –	11.9	0.57	Excellent
NOAA → NPP SD3E	FY '14 –	601.3	522.3	Good

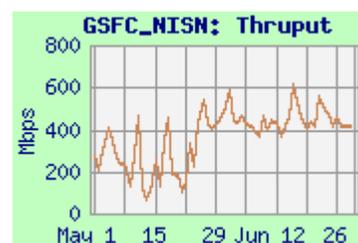
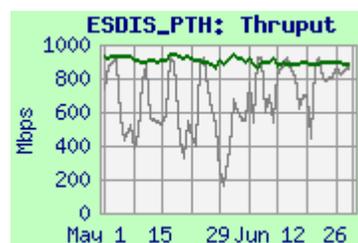
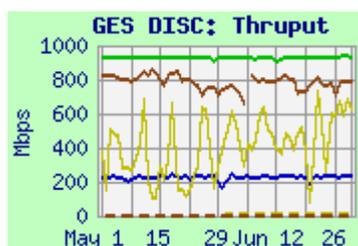
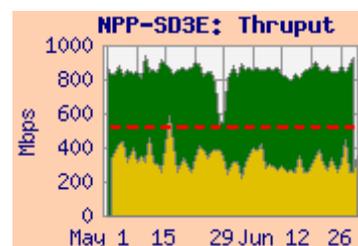
Comments:

2.1.1 NOAA → NPP-SD3E: Performance from **NOAA-PTH** to GSFC NPP-SD3E-OPS1 was very steady at over 800 mbps, limited by the Gig-E interface on the NOAA side test machine (the circuits are all 10 gbps). User flow was close to usual, and close to the requirement without contingency.

2.1.2 EROS LPDAAC, EROS-PTH → GSFC: The thrupt for tests from **EROS LPDAAC** to GES DISC and from **EROS-PTH** to ESDIS-PTH were again noisy, with the PTH's getting better results than the DAACs.

2.1.3 JPL → GSFC: Thrupt from **JPL-PODAAC** to GES DISC is noisy but stable. Note that JPL → EBnet flows take Internet2 instead of NISN, based on JPL routing policies. The requirement was increased this month by adding **OCO2 flows**. Thrupt was well above 3 x the requirement, so the rating remains **Excellent**. The 3.4 mbps average user flow was close to typical, and about 50% of the new requirement (without contingency, prior to OCO2 launch).

Testing from **JPL-TES** to GSFC-NISN is routed via NISN PIP, and shows the capability of that network.



2.1) to NPP, GES DISC continued.

2.1.4 LaRC → GSFC: Performance from **LaRC ASDC** to GES DISC was very stable this month, as it has been since the host upgrade at ASDC in February '14. Thruput from **LaRC ANGe** to ESDIS-PTH was also stable. Both results remained way above 3 x the modest requirement, so the rating continues as **Excellent**. The user flow this month was back down near the requirement – and below last month's 4 x the requirement.

2.1.5 NSIDC → GSFC: Performance from **NSIDC** to GES DISC improved in October 2013, due to an upgraded host at NSIDC, dropped in January due to NSIDC routing issues, and recovered in February. It remained way above the tiny requirement, so the rating remains **Excellent**. The user flow was again well above both the old and lower new requirement. Thruput to **GSFC-ISIPS** using SCP remains well above the requirement.

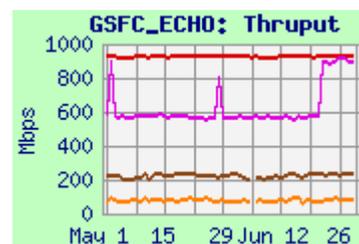


2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfcc/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	n/a	n/a	n/a
GES DISC	937.7	927.9	889.1
GES DISC ftp	603.8	572.5	528.9
LaRC ASDC DAAC	n/a	n/a	n/a
NSIDC DAAC	243.6	226.5	161.4
NSIDC DAAC ftp	110.2	77.2	38.1



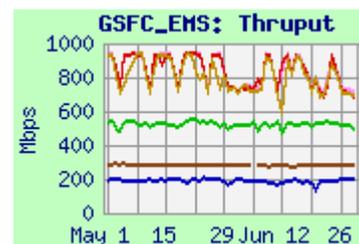
Comments: Performance was mostly stable from **GSFC** and **NSIDC**. FTP performance is mostly limited by TCP window size – especially from sites with long RTT. Testing from **EROS LPDAAC** stopped working in December, and from **LaRC ASDC** in early January due to host upgrades – testing resumed in July.

2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfcc/GSFC_EMS.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	203.3	190.4	80.8
ESDIS-PTH	929.1	767.5	651.1
GES DISC	910.8	759.6	637.3
LARC ASDC	566.7	520.4	377.0
MODAPS-PDR	907.1	744.3	589.0
NSIDC-SIDADS	283.3	281.3	243.4



Comments: Testing is performed to GSFC-EMS from the above nodes, iperf only. The test server went down in early April for maintenance – was restored in May. Testing from **EROS LPDAAC** stopped working in December with the host upgrade at EROS – fixed in May. Performance was mostly stable from other sources.

3) JPL:

3.1) GSFC → JPL:

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

Test Results: (additional results on next page)

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NPP-SD3E-OPS1 → JPL-AIRS	632.0	306.8	182.8	87.0	346.5
GSFC-GES DISC → JPL-AIRS	412.4	342.6	223.5		
ESDIS-PTH → JPL-AIRS	520.3	266.6	151.6		
GSFC-NISN → JPL-AIRS	297.8	108.5	37.6		
NPP-SD3E-OPS1 → JPL-Sounder	615.4	325.0	193.6		
GSFC-NISN → JPL-Sounder	279.1	114.4	50.5		
ESDIS-PTH → JPL-MLS	448.9	316.3	180.4		
GSFC-NISN → JPL-MLS	436.6	222.3	84.1		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → JPL Combined	FY '14	114.8	63	Excellent
GSFC → JPL AIRS	FY '14	54.3	40	Excellent
GSFC → JPL OCO2	FY '14-	36.6	-	Good
GSFC NPP → JPL Sounder	FY '14-	15.9	15	Excellent
GSFC → JPL Other	FY '14-	7.9	1.0	Excellent

Comments:

3.1.1 AIRS , Overall:

http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

The requirements were switched in June '14 to use the updated requirements database, adding OCO2 requirements (SMAP requirements will be added in FY'15). In June '12 they were switched to use the requirements database, instead of Handbook v1.4.3 previously.

The AIRS tlcf node was moved to a new location in June 2013. When testing resumed about 2 weeks later, thrupt was significantly lower from all sources. But the median integrated thrupt from **NPP-SD3E-OPS1** remained above 3 x the increased AIRS requirement, so the AIRS rating remains **Excellent**.

3.1.2 The JPL overall rating

is also based on the **NPP-SD3E-OPS1** to JPL AIRS thrupt, compared with the sum of all the GSFC to JPL requirements. The median thrupt also remained [very slightly] above 3 x this increased requirement, so the overall rating remains **Excellent**. The average user flow this month was consistent with the increased requirement, with some OCO2 pre-launch testing.

3.1.3 NPP to JPL Sounder:

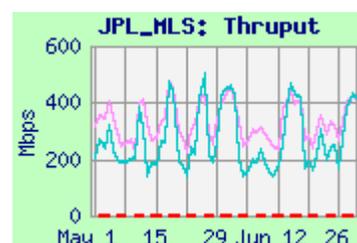
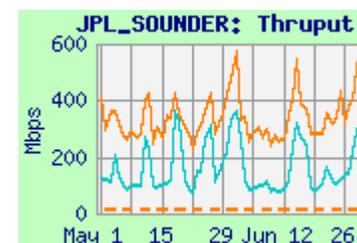
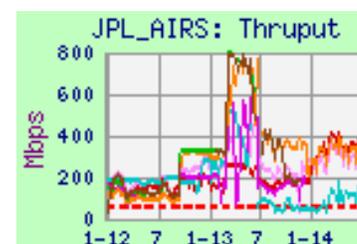
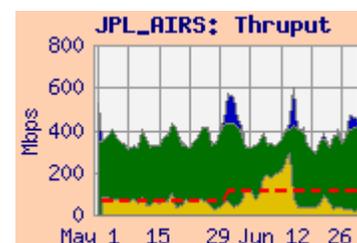
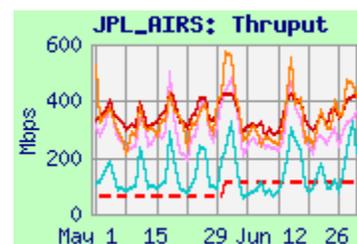
http://ensight.eos.nasa.gov/Missions/NPP/JPL_SOUNDER.shtml

Performance for this month from **NPP-SD3E-OPS1** and **GSFC-NISN** had large diurnal variation, but was mostly stable.

3.1.4 MLS:

http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml

Thruput from both **ESDIS-PTH** and **GSFC-NISN** were noisy this month. Both were way above the modest requirement, so the rating remains **Excellent**.



3.1) GSFC → JPL: continued

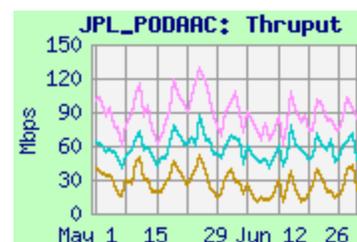
Test Results: continued

Source → Dest		Medians of daily tests (mbps)		
		Best	Median	Worst
ESDIS-PTH → JPL-PODAAC		119.9	83.5	47.5
GSFC-NISN → JPL-PODAAC		81.3	54.5	32.2
MODAPS-PDR → JPL-PODAAC		47.4	20.5	9.9
ESDIS-PS → JPL-QSCAT		92.8	91.1	80.0
GSFC-NISN → JPL-QSCAT		72.8	59.3	40.7
GSFC-EDOS → JPL-SMAP	1 stream	79.1	17.5	1.3
	6 streams	218.2	106.6	7.8
GSFC-EDOS → JPL-OCO2	1 stream	65.3	17.8	1.4
	6 streams	203.4	87.7	5.6

3.1.5 PODAAC:

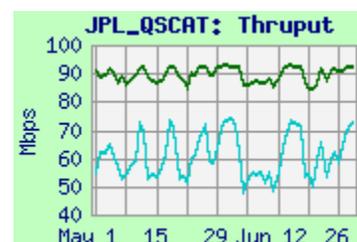
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

There is no longer a requirement from GSFC to JPL PODAAC in the database. Performance was a bit noisy but mostly stable; thruptup was way above the previous 1.5 mbps PODAAC requirement.

**3.1.6 QSCAT:**

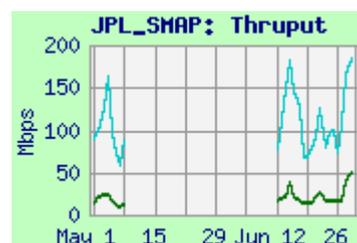
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml

There is no longer a requirement from GSFC to JPL QSCAT in the database. Thruptup from **ESDIS-PS** and **GSFC-NISN** to QSCAT was pretty stable, and remains well above the modest previous 0.6 mbps requirement.

**3.1.7 SMAP:**

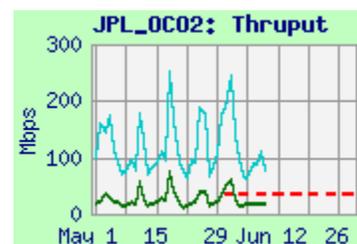
http://ensight.eos.nasa.gov/Organizations/daac/JPL_SMAP.shtml

There is no requirement from GSFC to JPL SMAP in the database [until FY '15]. Testing from EDOS to SMAP is done using both a **single stream** and **6 streams**. Performance improved in early March, similar to the performance from EDOS to many other sites. **The SMAP server went down in early May – restored in June.**

**3.1.8 OCO2:**

http://ensight.eos.nasa.gov/Organizations/daac/JPL_OCO2.shtml

The requirement from GSFC to JPL OCO2 begins this month, in preparation for next month's launch! Testing from EDOS to OCO2 is done using both a **single stream** and **6 streams**. **Testing began failing in early June.** Previously, performance from EDOS (using 6 streams) would have been rated **Good**. Single stream performance would be rated **Low**.



3.2) LaRC → JPL

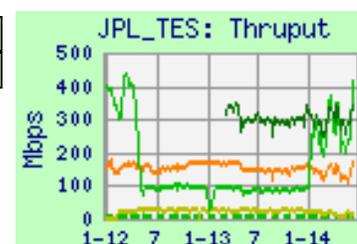
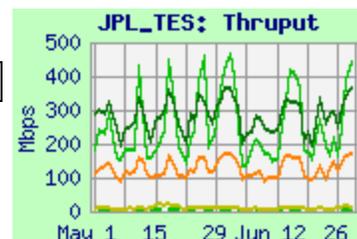
Rating: Continued **Good**

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)			User Flow
	Best	Median	Worst	
LaRC ASDC → JPL-TES	416.3	212.2	76.6	
LaRC ANGE → JPL-TES	392.8	283.4	163.6	
LaRC PTH → JPL-TES	174.7	122.0	62.6	
LaRC PTH → JPL-TES sftp	24.2	8.9	4.9	
LaRC ASDC → JPL-MISR	46.2	26.3	3.8	
LaRC PTH → JPL-MISR	55.9	20.0	4.3	3.3
LaRC ANGE → JPL-PTH	301.6	256.3	28.9	7.3



Requirements:

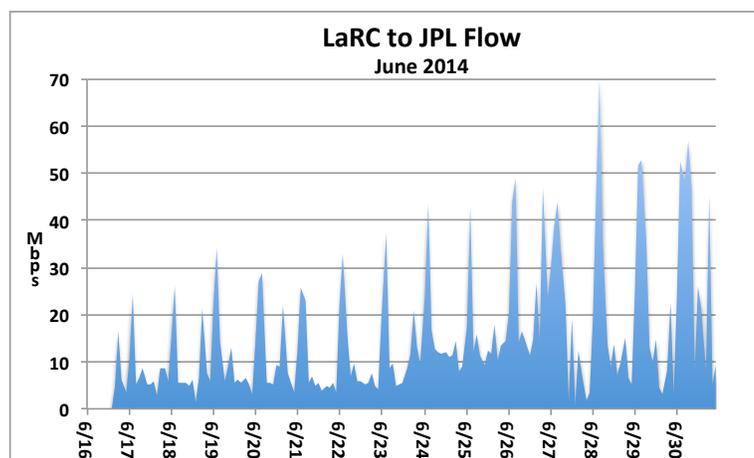
Source → Dest	Date	Mbps	Prev	Rating
LaRC → JPL-Combined	CY '12 –	83.5	69.3	Good
LaRC ASDC → JPL-MISR	CY '12 –	78.1	62.3	Low
LaRC ASDC → JPL-TES	CY '12 –	5.5	7.0	Excellent

3.2.1 LaRC → JPL (Overall, TES): Performance from LaRC ASDC to JPL-TES improved dramatically in early January with the ASDC node upgrade! It is now similar to (but noisier than) the thrupt from LaRC ANGe, and that previously seen from LaRC ASDC until April 2012. The median thrupt remained below 3 x the combined requirements, so the Overall rating remains to **Good**.

The median thrupt remained well over 3 x the TES requirement, so the TES rating remains **Excellent**. User flow to TES is very low.

Performance from LaRC PTH to JPL-TES is more stable, but is limited to 200 mbps by agreement with CSO / NISN.

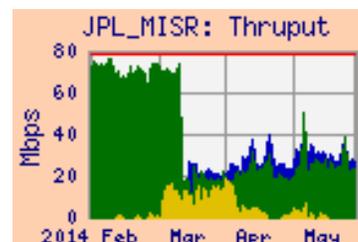
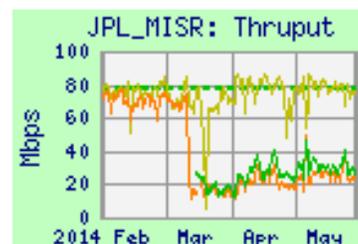
The LaRC to JPL integrated graph is not included this month, due to revised format of the flow data – the scripts have not been updated to incorporate the new version yet. Instead, the graph on the right shows the user flow from LaRC to JPL for the last half of June (no flow data was collected during the first half of June). This affected the average value shown above – the average flow for the period shown is 15.3 mbps).



3.2) LaRC → JPL (continued)

3.2.2 LaRC → JPL-MISR: Testing from the upgraded **LaRC ASDC** node to JPL-MISR was unblocked in March; results from ASDC to MISR are similar to that from LaRC PTH. Thruput from LaRC to JPL MISR is limited by the Fast-E connection to the MISR node. Thruput to MISR from both sources dropped severely in March, after improving in December. The median integrated thruput from **LaRC ASDC** was slightly above 1/3 of the MISR requirement, so the MISR rating remains **Low**. User flow was again low this month, now averaging about 4% of the requirement (peaked at 13% in March). Note that the user flow peak occurred in February, BEFORE the measured thruput dropped in March, suggesting that the user flow is not the cause of the thruput drop.

The LaRC → JPL Overall rating is not based on this result, however, since it not indicative of the capability of the network.



4) LaRC

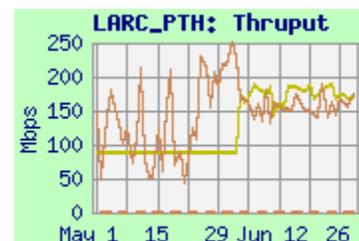
4.1) JPL → LaRC

Rating: Continued **Excellent**

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

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
JPL-PTH → LaRC PTH	244.3	174.5	93.3	21.6
JPL-TES → LaRC PTH	261.0	157.9	88.4	



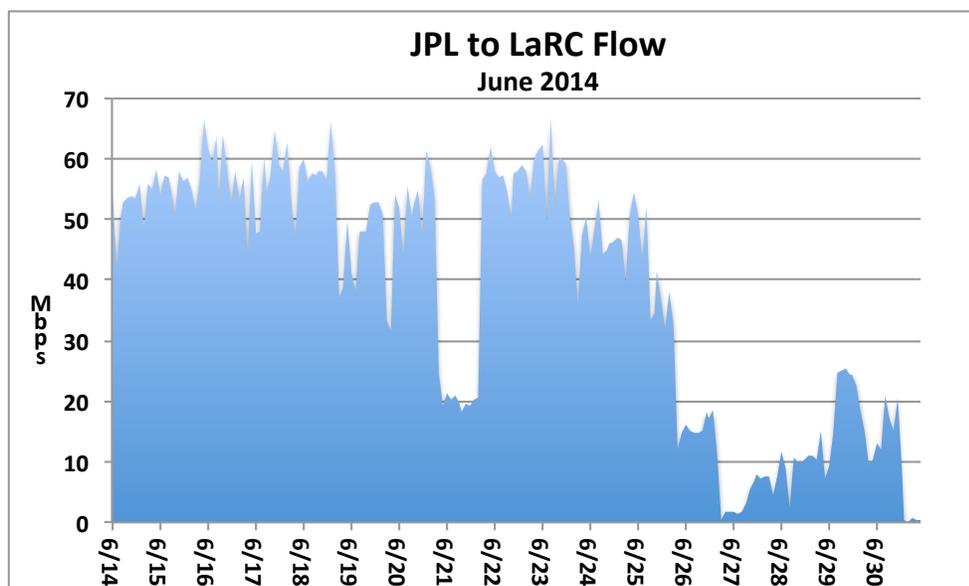
Requirements:

Source → Dest	Date	Mbps	Prev	Rating
JPL → LaRC	CY '12 –	1.1	1.5	Excellent

Comment: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. The route from JPL to LaRC is via NISN PIP. This month the thrupt from JPL-TES was again noisy but remained much higher than the requirement; the rating remains **Excellent**. The user flow this month again peaked well above the 1.1 mbps requirement.

Thruput from JPL-PTH to LaRC-PTH increased at the beginning of June, when JPL-PTH was connected to a Gig-E port on a NISN switch – previously it was limited to 100 mbps due to its connection to a Fast-E port. The thrupt is now similar to thrupt from JPL-TES. Thruput from JPL-PTH had been stable at the higher of its two common states (88 mbps) since January 2013.

The JPL to LaRC integrated graph is not included this month, due to revised format of the flow data – the scripts have not been updated to incorporate the new version yet. Instead, the graph below shows the user flow from JPL to LaRC for the last half of June (no flow data was collected during the first half of June). This affected the average value shown above – the average flow for the period shown is 38.0 mbps). This is the entire flow from JPL to LaRC – it may not all be EOS related.



4.2) 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_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LaRC ASDC	935.6	928.4	760.6	51.9	930.5
GSFC-EDOS → LaRC ASDC	927.5	882.2	131.2		
ESDIS-PTH → LaRC-ANGe	913.7	837.4	614.4		
GSFC-NISN → LaRC-ANGe	900.5	826.3	648.2		
GES DISC → LaRC-PTH	613.1	601.8	565.5		
GSFC-NISN → LaRC-PTH	620.2	600.9	576.1		
NPP-SD3E → LaRC-PTH	644.9	627.1	569.4		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → LARC (Combined)	CY '12 –	60.7	52.2	Excellent

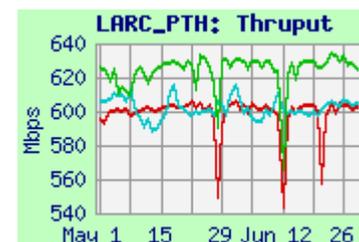
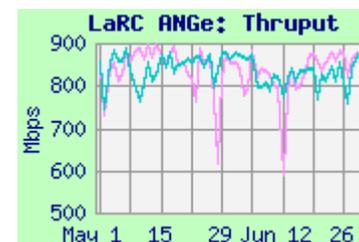
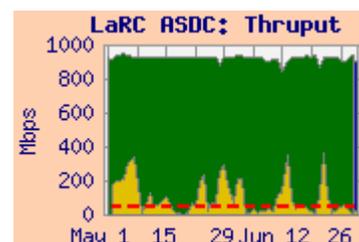
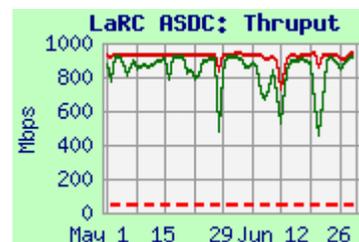
Comments:

GSFC → LaRC ASDC: Thruput from **GES DISC** to LaRC ASDC DAAC remained well above 3 x the increased combined requirement, close to the circuit limitation, so the rating remains **Excellent**. Thruput to ASDC from **GSFC-EDOS** was slightly lower and noisier, but improved a bit in mid March along with other tests from EDOS.

As seen on the integrated graph, the 52 mbps average user flow this month was close to typical and the requirement.

GSFC → ANGe (LaTIS): Testing to ANGe (“Bob”) from both **ESDIS-PTH** and **GSFC-NISN** was stable, close to the circuit limitation. (Note the expanded scale on the graph).

GSFC → LaRC-PTH: Testing to LaRC-PTH from **GES DISC**, **NPP-SD3E**, and **GSFC-NISN** was very stable, but below the performance to ASDC and ANGe. (Note the expanded scale on the graph).



5) Boulder CO sites:

5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
 GHRC → NSIDC: Continued **Excellent**
 JPL → NSIDC: **N / A**

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_PTH.shtml

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → NSIDC DAAC	587.9	565.0	263.2	9.4	565.0
GES-DISC → NSIDC DAAC	630.9	596.9	371.1		
GSFC-EDOS → NSIDC DAAC	622.1	596.1	57.3		
ESDIS-PTH → NSIDC DAAC	844.9	815.1	493.9		
GSFC-ISIPS → NSIDC (iperf)	633.1	628.2	473.4		
JPL PODAAC → NSIDC DAAC	558.6	524.8	371.2		
GHRC → NSIDC DAAC (nuttcp)	49.0	13.0	2.0	0.09	
GHRC → NSIDC DAAC (ftp pull)	45.2	22.7	2.7		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → NSIDC	FY '14 –	1.06	8.42	Excellent
JPL → NSIDC	FY '14 –	-0-	0.16	N / A
GHRC → NSIDC	FY '14 –	2.08	0.46	Excellent

Comments: The requirements have been updated with the FY '14 database. AMSR-E flows from EDOS (PDS) and JPL have been removed, and 20.8 mbps of MODIS reprocessing does not begin until August.

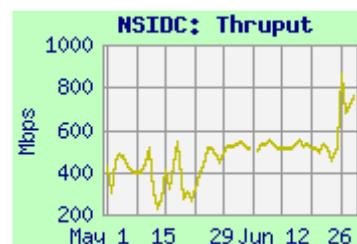
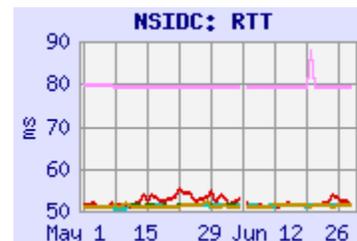
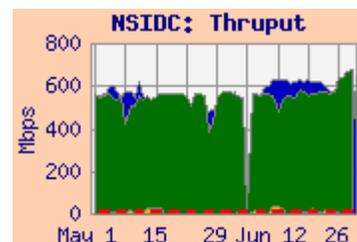
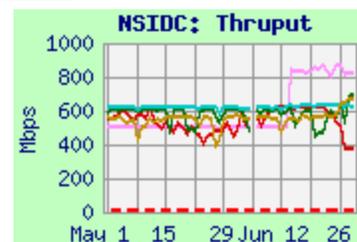
5.1.1 GSFC → NSIDC S4PA: The rating is based on testing from the MODAPS-PDR server to the NSIDC DAAC, since that is the primary flow.

The median thrupt from MODAPS-PDR remained well above 3 x the current requirement, so the rating remains **Excellent**. The 9.4 mbps average user flow was above the previous, higher requirement -- WITH contingency.

Testing from GES-DISC, GSFC-EDOS, and GSFC-ISIPS was also mostly stable. These tests use 15 streams to mitigate the small TCP windows on the NSIDC server. The sysadmin increased the window size at the end of June, with increased thrupt – with fewer streams.

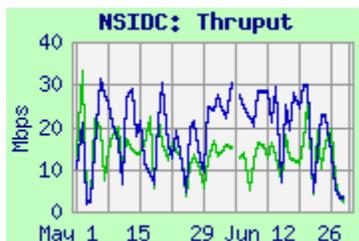
Testing from ESDIS-PTH gets lower thrupt, due to a higher RTT, based on a different return route from FRGP. Additional streams were added in June, to achieve thrupt greater than 600 mbps.

5.1.2 JPL PODAAC → NSIDC S4PA: The AMSR-E flow requirement was removed – there is no longer a JPL to NSIDC requirement (a new 17.1 mbps flow for SMAP will begin in FY '15).. Thrupt from JPL PODAAC to NSIDC is well above the previous and future SMAP requirements. Thrupt from JPL also improved with NSIDC increased window size. Note the expanded scale on the graph.



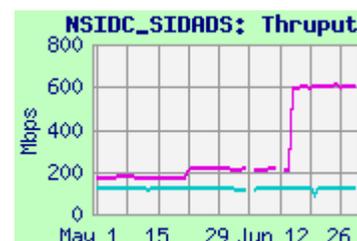
5) Boulder CO sites (Continued):

5.1.3 GHRC, GHRC-ftp → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL) sends reprocessed AMSR-E data to NSIDC via Internet2. The median integrated thrupt remained above 3 x the increased 2.08 mbps (previously 0.46 mbps) requirement, so the rating remains **Excellent**. This requirement increases to 5.14 mbps in September when L2A reprocessing begins.



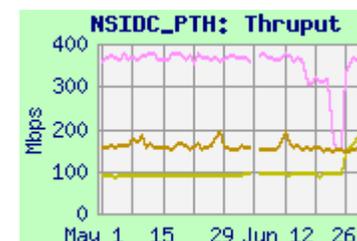
Test Results: NSIDC-SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	612.0	594.0	417.5
GSFC-NISN → NSIDC-SIDADS	122.1	121.0	92.7
ESDIS-PTH → NSIDC-PTH	400.1	359.2	263.1
MODAPS-PDR → NSIDC-PTH	201.3	152.2	133.1
JPL-PTH → NSIDC-PTH	92.5	92.3	78.5



5.1.4 GSFC → NSIDC-SIDADS: Performance from GSFC-NISN to NSIDC-SIDADS was very stable. Performance from GSFC-ENPL was returned in June with increased thrupt.

5.1.5 NSIDC-PTH: Thrupt from GSFC sources to NSIDC-PTH was stable. JPL-PTH was limited by its Fast-E connection until it was upgraded and testing returned in June).



5.2) LASP:

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

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

Test Results:

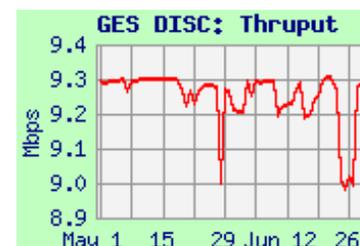
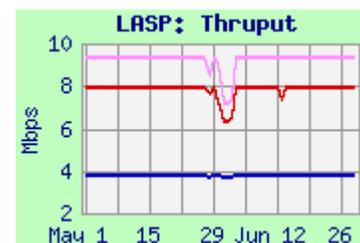
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (scp)	3.80	3.77	3.65
ESDIS-PTH → LASP blue (iperf)	9.38	9.36	8.19
GES DISC → LASP blue (iperf)	7.97	7.95	6.95
LASP → GES DISC	9.30	9.25	8.97

Requirement:

Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 -	0.016	Excellent

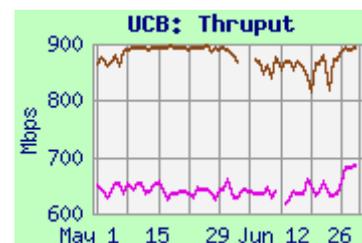
Comments: In January '11, LASP's connection to NISN PIP was rerouted to a 10 mbps connection to the NISN POP in Denver; previously it was 100 mbps from CU-ITS via NSIDC.

Iperf testing from GES DISC has been very stable since February 2013, when it improved with the GES DISC firewall upgrade. Iperf and SCP testing from ESDIS-PTH was also very stable, and consistent with the circuit limitation, as was return testing from LASP to GES DISC, rating **Excellent**.



5.3) UCB:Web Page <http://ensight.eos.nasa.gov/Organizations/daac/UCB.shtml>**Test Results:**

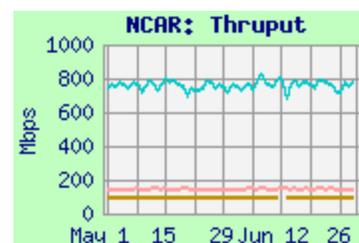
Source	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL	706.3	637.2	571.5
GSFC-ESTO	902.0	867.4	558.1



Comments: Testing to the 10 gig connected test node at UCB began failing consistently in mid-May 2013, so testing was switched to a 1 gig test node in mid-June. The route is via Internet2 to FRGP, similar to NCAR. Thruput from both GSFC-ENPL and GSFC-ESTO was stable.

5.4) NCAR:
 Ratings: LaRC → NCAR: Continued **Excellent**
 GSFC → NCAR: Continued **Excellent**
Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>**Test Results:**

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC PTH	174.2	146.2	117.2
GSFC-ENPL-10G	4410.0	3665.0	2130.0
GSFC-ENPL-FE	94.6	94.4	93.9
GSFC-NISN	848.3	763.9	400.2

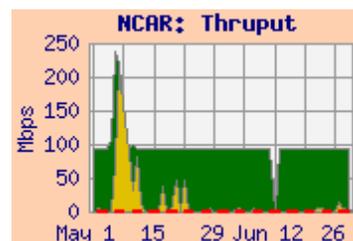
**Requirement:**

Source	Date	Mbps	Prev	Rating
LaRC	CY '12 -	0.044	0.1	Excellent
GSFC	CY '12 -	0.111	5.0	Excellent

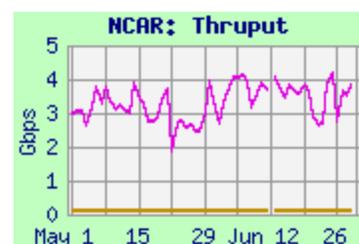
Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements.

Testing was switched to NCAR's 10 gigabit capable PerfSonar server in March '12 – testing was discontinued from LaRC ASDC at that time; testing from LaRC-PTH continued.

From LaRC: Thruput from LaRC-PTH was stable. The median remained well above 3 x the tiny requirement, so the rating remains **Excellent**. Note that outflow from LaRC-PTH is limited to 200 mbps by agreement with CSO / NISN.



From GSFC: From GSFC-NISN, the route is via NISN to the MAX (similar route as from LaRC-PTH). Thruput was mostly stable this month. The median was well above 3 x the tiny requirement, so the rating remains **Excellent**. There was a peak user flow from GSFC-EBnet last month, averaging 26.2 mbps, waaaay above the revised requirement, and the previous requirement as well. The user flow this month was a more normal 2.3 mbps.



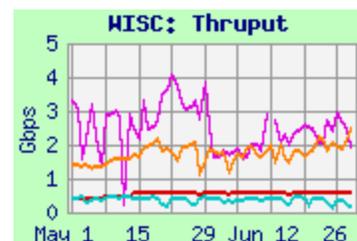
From GSFC-ENPL-10G, with a 10 Gig-E interface, and a 10 gig connection to MAX, performance to NCAR's 10 Gig PerfSonar node is also a little noisy, but gets over 4 gbps on peaks.

6) Remote Sensing Systems (RSS):Ratings: **JPL** → **RSS**: N/A
RSS → **GHRC**: N/AWeb Page <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>

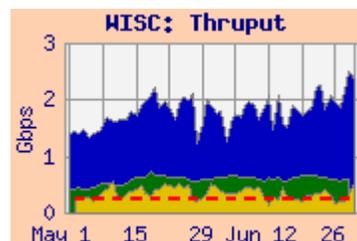
Comments: RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving L1 data from JAXA via JPL, and sending its processed L2 results to GHRC (aka NSSTC) (UAH, Huntsville, AL). **Note that AMSR-E has not been operating since November, 2011, so that this data is not flowing. Thus there are no longer any EOS requirements for flows to or from RSS.**

7) Wisconsin:Rating: Continued **Excellent**Web Pages <http://ensight.eos.nasa.gov/Missions/NPP/WISC.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NPP-SD3E	2368.8	1828.1	1137.9	273.6	1849.8
GES DISC	580.2	571.6	532.9		
GSFC ENPL	6608.8	2073.0	813.9		
LaRC ANGe	474.6	375.0	184.7		

**Requirements:**

Source Node	Date	mbps	Prev	Rating
NPP-SD3E	FY'14 -	242.3	237.2	Excellent
GSFC MODAPS	FY'14 -	21.9	16.5	Excellent
GSFC Combined	FY'14 -	264.2	253.7	Excellent
LaRC Combined	CY'12 -	n/a	7.9	n/a



Comments: The University of Wisconsin is included in this Production report due to its function as Atmosphere PEATE for NPP. Wisconsin continues to be an SCF on the MODIS, CERES and AIRS teams.

GSFC: At the end of March 2013, testing from **GSFC-ENPL** was switched to a new 10 gig server at Wisconsin (SSEC), with thruput now typically 2 - 4 gbps.

User flow was above, but close to the requirement, similar to last month.

Testing from **NPP-SD3E** was also switched to Wisconsin's 10 gig server, in May 2013, with thruput now usually close to 2 gbps! The integrated thruput from **NPP-SD3E** remained above the NPP requirement by 3 x, so the NPP rating remains **Excellent**. It was also above the GSFC combined requirement by more than 3 x, so the combined rating also remains **Excellent**.

The route from EBnet at GSFC is via MAX to Internet2, peering with MREN in Chicago.

LaRC: There is no longer a CERES requirement from LaRC to Wisconsin. In April 2013, testing from **LaRC ANGe** was switched to the new SSEC 10 gig server; performance improved at that time. Thruput from **LaRC ANGe** remains well above the previous 7.9 mbps requirement; it would be rated **Excellent**. The route from LaRC is via NISN, peering with MREN in Chicago.

8) KNMI:Rating: Continued **Excellent**Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
OMISIPS → KNMI-ODPS	128.9	79.1	58.5	1.79	79.1
GSFC-ENPL → KNMI-ODPS	540.0	121.0	81.0		

Requirements:

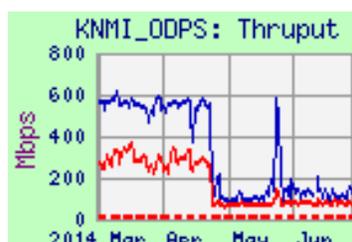
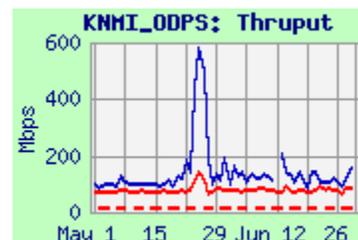
Source Node	Date	mbps	Prev	Rating
OMISIPS	CY'12 -	13.4	0.03	Excellent

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 2+ x 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam.

The requirement was increased with the use of the database to 13.4 mbps, a much more realistic value than the previous 0.03 mbps.

The rating is based on the results from **OMISIPS** on EBnet at GSFC to the ODPS primary server at KNMI. Thruput from both sources was stable until near the end of April, when it dropped significantly, due to increased packet loss. But the median thruput remains well above 3 x the increased requirement, so the rating remains **Excellent**.

The user flow, however, averaged only 1.79 mbps this month, similar to recent months, but only 13% of the revised requirement.



9) JSpace - ERSD:

Ratings: **GSFC** → **ERSD**: Continued **Excellent**
ERSD → **EROS**: Continued **Excellent**
ERSD → **JPL-ASTER-IST**: N/A

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

US ↔ JSpace - ERSD Test Results

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → JSpace-ERSD	340.5	143.7	8.2	4.54	143.7
GES DISC → JSpace-ERSD	92.9	92.0	36.3		
GSFC ENPL (FE) → JSpace-ERSD	85.0	81.5	78.1		
GSFC ENPL (GE) → JSpace-ERSD	482.0	461.0	68.7		
JSpace-ERSD → EROS	312.9	297.0	165.3		
JSpace-ERSD → JPL-TES	125.1	63.5	27.4	5.57	297.0

Requirements:

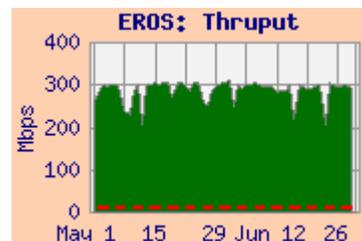
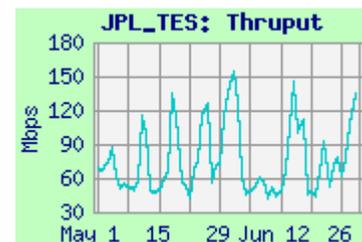
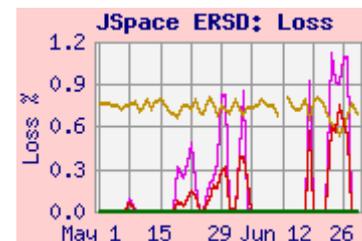
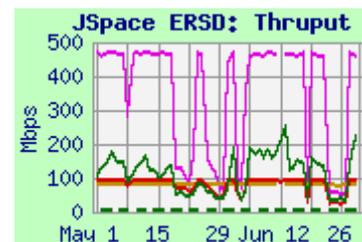
Source → Dest	CY	Mbps	Prev	Rating
GSFC → JSpace-ERSD	'14 -	16.4	6.75	Excellent
JSpace-ERSD → JPL-ASTER IST	'12 -	0.31	0.31	Excellent
JSpace-ERSD → EROS	'12 -	8.33	8.3	Excellent

Comments: **GSFC → JSpace-ERSD:** The median thrupt to JSpace-ERSD from most sources improved in September 2011, when the connection from JSpace-ERSD to Tokyo-XP was upgraded to 1 gbps (from 100 mbps). Peak thrupt from **GSFC ENPL** is now often over 400 mbps.

Performance from **GSFC-EDOS** improved in March 2013, similar to the performance from EDOS to many other sites. Thrupt remained well above 3 x the reduced requirement (**despite several periods of high packet loss and poor performance beginning in mid-May**), so the rating remains **Excellent**. The user flow was close to normal from GSFC to JSpace-ERSD this month, below the increased requirement.

JSpace-ERSD → JPL-ASTER-IST: The JPL-ASTER-IST test node was retired in October 2012. JPL no longer uses a distinct IST; instead, JPL personnel log in directly to the IST at JSpace-ERSD. As a substitute, testing was initiated from ERSD to a different node at JPL ("TES"). Results to TES were noisy but mostly stable, and would be rated **Excellent**.

JSpace-ERSD → EROS: The thrupt improved with retuning in October '11, after the ERSDAC Gig-E upgrade. Thrupt remains well above the reduced requirement (was 26.8 mbps previously), so the rating remains **Excellent**. The user flow this month was consistent with the requirement, without contingency.



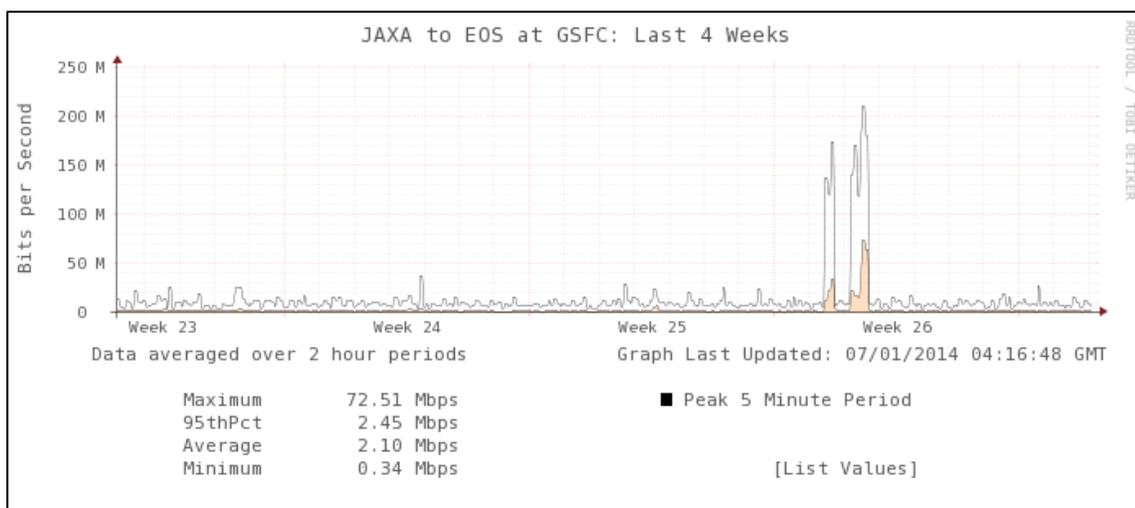
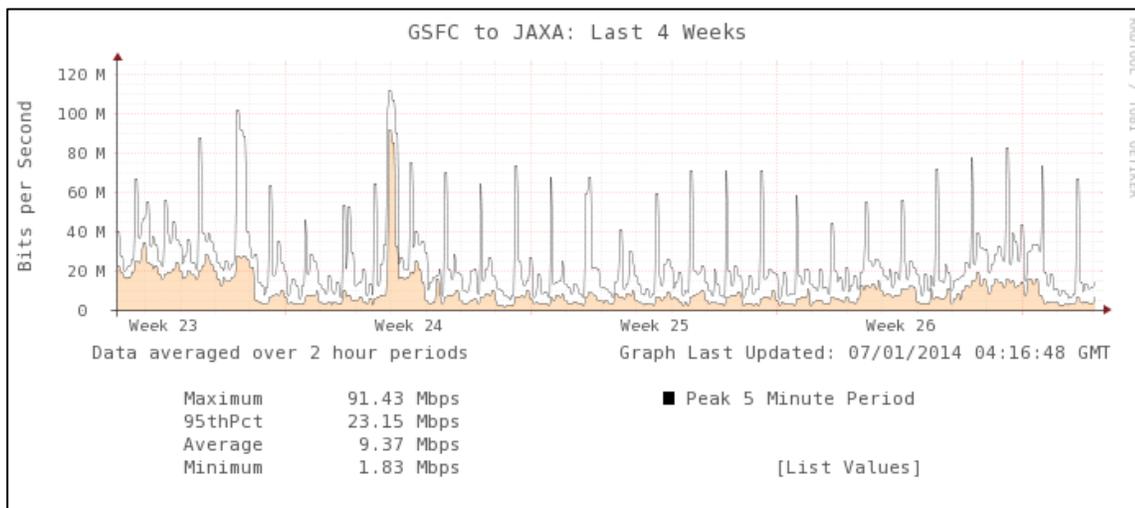
10) GSFC ← → JAXA

Ratings: GSFC → JAXA: N/A
 JAXA → GSFC: N/A

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009. No additional testing is planned for AMSR, TRMM, or GPM. All testing to JAXA-TKSC for ALOS was terminated at the end of June '09. JAXA has been requested to restore these tests – primarily for GPM -- but has declined to participate.

However, the user flow between GSFC-EBnet and JAXA continues to be measured. As shown below, the user flow this month averaged 9.4 mbps from GSFC-EBnet to JAXA, and 2.1 mbps from JAXA to GSFC-EBnet.

These values are below the new (database) requirements of 15.4 mbps (previously 3.36 mbps) from GSFC to JAXA (increased due to GPM), and 3.3 mbps from JAXA back to GSFC (The AMSR-E requirement from JAXA to JPL has been removed, due to AMSR-E failure). However, since no iperf tests are run, the true capability of the network cannot be determined, and therefore no rating is assigned.



For comparison, testing is performed from GSFC to a test node at the Tokyo Exchange point, which is on the route to JAXA from GSFC. After the APAN drop was corrected in December 2013, testing was switched to the Tokyo-XP 10 gig server, with much improved results, well in excess of the JAXA requirements..

