EOS Production Sites
Network Performance Report: December 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: 3.61** ↑ (was 3.56 last month)
- **Requirements**: using the Network Requirements Database for 2014
  - Including GPM, OCO2, and SMAP missions
  - MODIS and AMSR Reprocessing requirements included
- **Only 2 flows below Good**
  - **GSFC → EROS: Low**
  - **NOAA → GSFC-NPP-SD3E: Low**
    - Probably just a problem with the NOAA test node

Ratings Changes:

Upgrades: ↑

GSFC-EDOS → JPL-SMAP: Adequate → Excellent

LaRC → JPL-TES: Good → Excellent

Downgrades: ↓ None

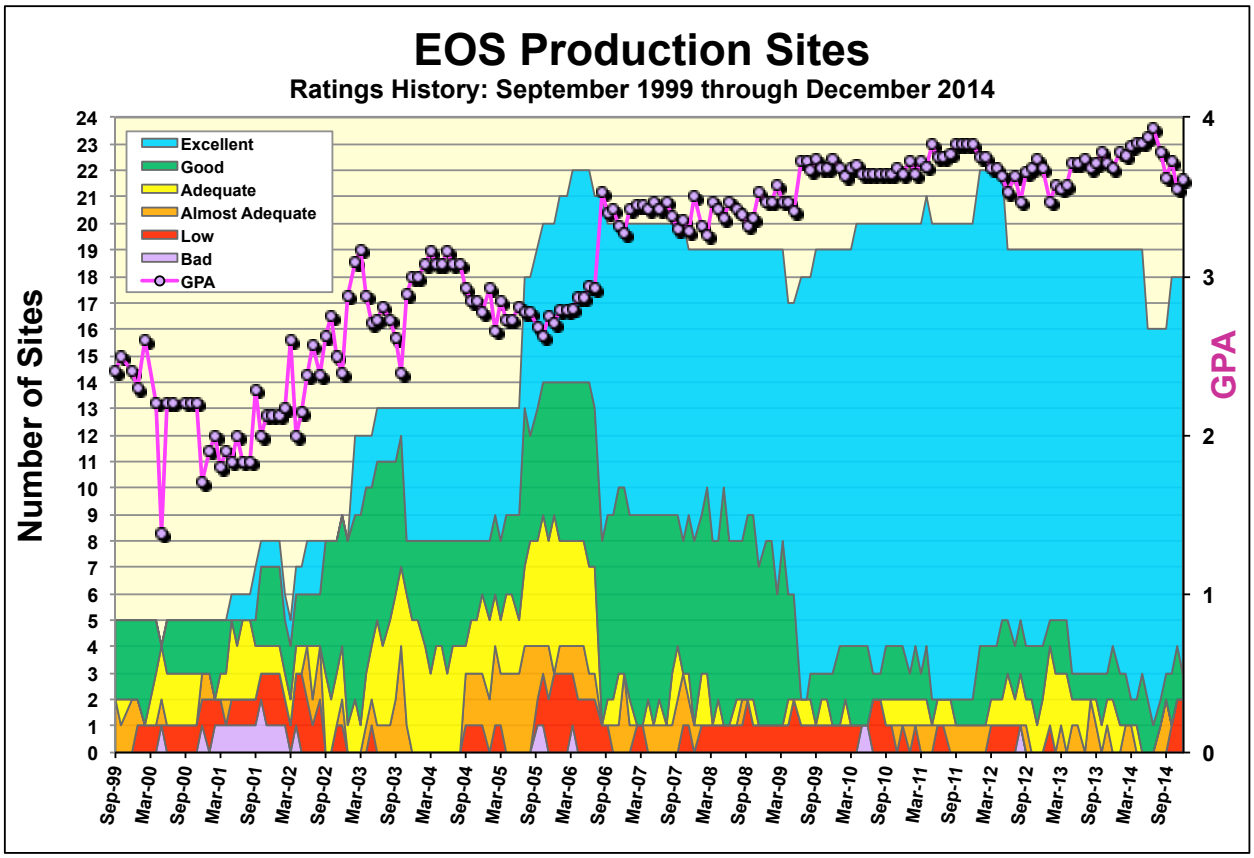
Ratings Categories:

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
2014 October: Added JPL to NSIDC requirement for SMAP
Added GSFC to GHRC requirement for LANCE

Requirements Basis:

In June 2014, the requirements were updated to the latest values in the database!

- Added flows for GPM, OCO2, and SMAP (effective FY '15) missions
- Removed AMSR-E, ICESAT flows (AMSR-E reprocessing remains includes)
- MODIS reprocessing incorporated month-by-month
    - Reprocessing requirement began 2014 August

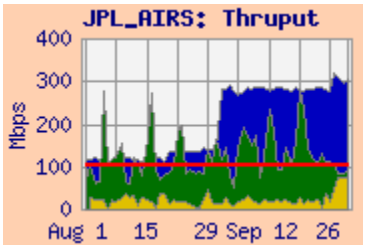
In June 2012, the requirements were switched, to use the EOSDIS network requirements database.

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.

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Network Requirements vs. Measured Performance

December 2014

Source → Destination	Instrument (s)	Requirements (mbps) Current FY '15	Requirements (mbps) Old FY '12	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re FY '15 Requirements This Month	Ratings re FY '15 Requirements Last Month
GSFC → EROS	MODIS, LandSat	1016.2	548.4	MODAPS-PDR → EROS LPDAAC	24.1	664.3	671.5	Low	Low
GSFC → JPL	AIRS, MLS, NPP, TES, OCO2, SMAP	121	63.0	NPP SD3E OPS1 → JPL-AIRS	91.0	770.8	779.4	Excellent	Ex
JPL → GSFC	MLS, OCO2	11.9	0.57	JPL-PODAAC → GSFC GES DISC	19.3	650.2	650.2	Excellent	Ex
LaRC → JPL	TES, MISR	83.5	83.5	LARC-ANGe → JPL-TES	5.7	356.7		Excellent	Good
JPL → LaRC	TES	1.1	1.1	JPL-TES → LARC-PTH	0.78	783.7	783.7	Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT, TES, MODIS	60.7	52.2	GSFC EDOS → LaRC ASDC	52.4	895.4	900.1	Excellent	Ex
LaRC → GSFC	MISR	0.6	0.6	LARC-ASDC → GES DISC	0.77	933.1	933.1	Excellent	Ex
JPL → NSIDC	AMSR-E, SMAP	17.1	0.16	JPL-SMAP → NSIDC	0.4	744.0		Excellent	Ex
NSIDC → GSFC	AMSR-E, MODIS, ICESAT	0.009	0.017	NSIDC DAAC → GES DISC	2.54	720.8	720.8	Excellent	Ex
GSFC → NSIDC	AMSR-E, MODIS, ICESAT, GBAD	38.5	8.4	MODAPS PDR → NSIDC-DAAC	7.4	579.0	579.0	Excellent	Ex
GHRC → NSIDC	AMSR-E	5.14	2.08	GHRC → NSIDC DAAC	0.012	10.8	10.8	Good	Good
GSFC → GHRC	AMSR-E, MODIS	2.9	0.00	GSFC EDOS → GHRC via NISN	7.18	255.0	255.0	Excellent	Ex
NOAA → GSFC	NPP	601.3	522.3	NOAA-PTH → GSFC NPP-SD3E OPS1	235.9	222.0	284.0	Low	Low
GSFC → Wisc	NPP, MODIS, CERES, AIRS	264.2	259.1	GSFC NPP-SD3E OPS1 → WISC	158.4	1458.3	1461.5	Excellent	Ex
LaRC → NCAR	MOPITT	0.044	0.044	LaRC-PTH → NCAR		181.3		Excellent	Ex
GSFC → JAXA	TRMM, AMSR-E, MODIS, GPM	15.4	3.5	GSFC-EBnet → JAXA	8.5	n/a		n/a	n/a
JAXA → GSFC	AMSR-E, GPM	3.3	0.16	JAXA → GSFC-EBnet	1.39	n/a		n/a	n/a
GSFC → JSpace	ASTER	16.4	6.8	GSFC-EDOS → JSpace-ERSD	4.76	358.3	360.2	Excellent	Ex
JSpace → EROS	ASTER	8.3	8.3	JSpace-ERSD → EROS PTH	10.0	302.0	302.0	Excellent	Ex
GSFC → KNMI	OMI	13.4	13.4	GSFC-OMISIPS → KNMI ODPS	1.77	44.7	45.0	Excellent	Ex

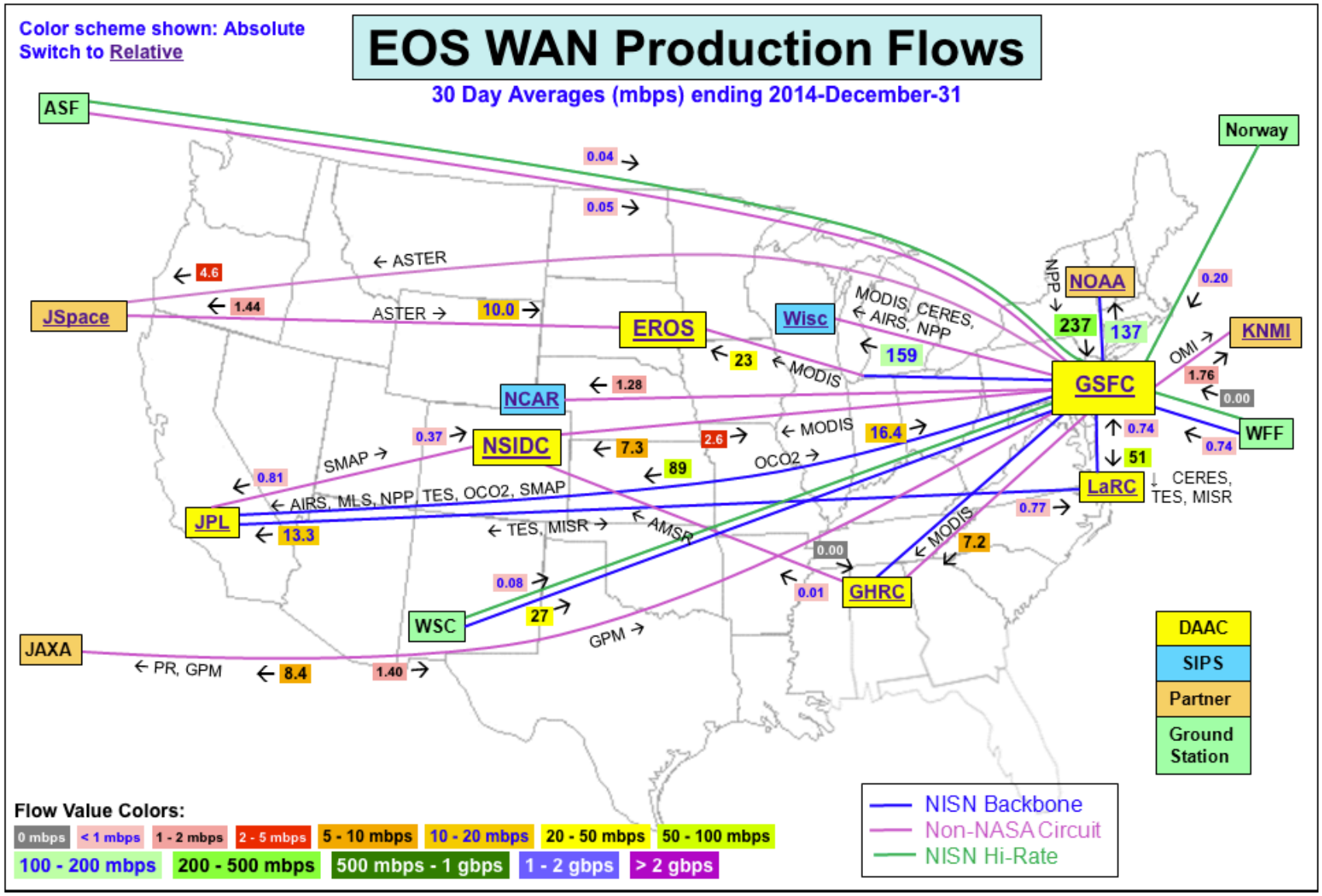
Significant change from FY '12 to FY '14

Changed in 2014 | Value used for ratings

*Criteria:		
	Excellent	**Total Kbps** > Requirement * 3
	Good	1.3 * Requirement <= **Total Kbps** < Requirement * 3
	Adequate	Requirement < **Total Kbps** < Requirement * 1.3
	Almost Adequate	Requirement / 1.5 < **Total Kbps** < Requirement
	Low	Requirement / 3 < **Total Kbps** < Requirement / 1.5
	Bad	**Total Kbps** < Requirement / 3

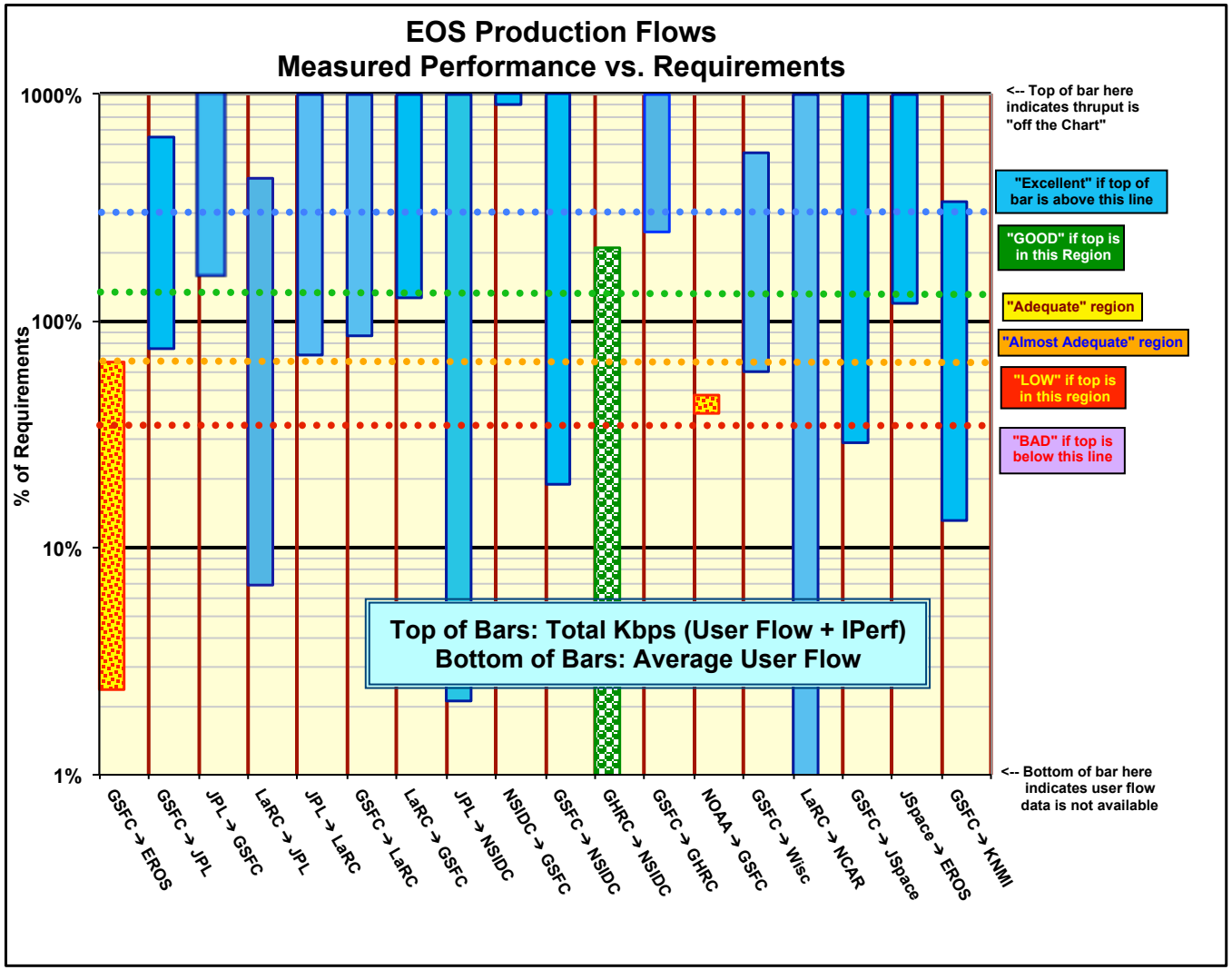
Notes: Flow Requirements include:
TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS, NPP, GPM, SMAP, OCO2

Ratings Summary	FY '15 Req Score	FY '15 Req Prev
Excellent	15	14
Good	1	2
Adequate	0	0
Almost Adequate	0	0
Low	2	2
Bad	0	0
Total Sites	18	18
GPA	3.61	3.56



This chart shows the averages for the main EOS production flows for the current month. **Closed side flows were not available this month.** Up to date flow information can be found at http://ensight.eos.nasa.gov/Weather/web/hourly/Production_Flows-A.shtml

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:

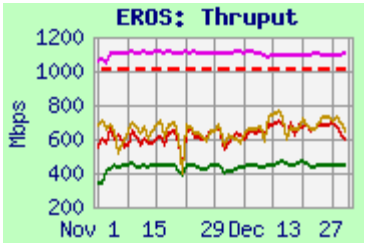
Ratings: GSFC → EROS: Continued **Low**
JSpace → EROS: Continued **Excellent**

1.1 GSFC → EROS:

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

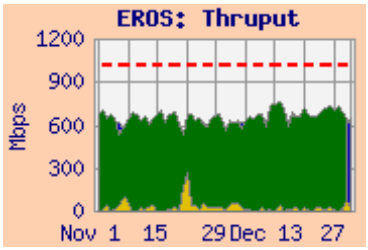
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS-PDR→ EROS LPDAAC	771.6	664.3	439.2	24.1	671.5
GSFC-EDOS → EROS LPDAAC	453.3	447.9	278.4		
GES DISC → EROS LPDAAC	763.0	648.4	460.9		
GSFC-ENPL → EROS LPDAAC	1109.0	1100.0	922.0		
GSFC-ENPL → EROS PTH	2317.7	2214.6	1867.2		
GSFC-ENPL → EROS PTH (IPv6)	n/a	n/a	n/a		
GSFC-NISN → EROS PTH	830.0	705.5	333.0		
ESDIS-PS → EROS PTH	851.4	698.2	510.0		



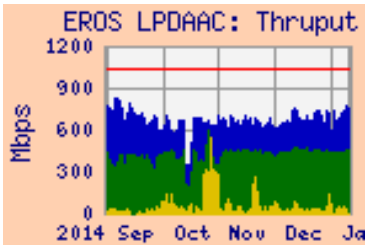
Requirements:

Source → Dest	Date	mbps	prev	Rating
GSFC → EROS	8/14	1016.1	49.8	Low



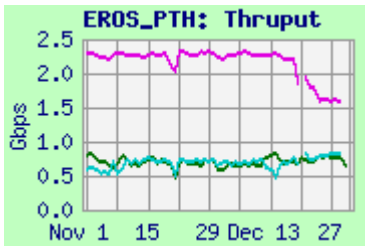
Comments: The rating is based on the **MODAPS-PDR** Server to EROS LP DAAC measurement, since that is the primary flow.

The reprocessing flow requirement began in August, so the requirement increased to 1016.1 mbps (was only 49.8 mbps previously). Note from the integrated graph that the flow actually increased in late October – the peaks were about 40% of the requirement (including reprocessing). But the user flow this month averaged only 24.1 mbps –lower than last month's 36 mbps, and only about 2.4% of the requirement.



Thruput from all sources was stable this month. The median integrated thruput from **MODAPS-PDR** to LPDAAC remained slightly below 2/3 of the new requirement (which includes reprocessing), so the rating remains **Low**.

The median thruput from **GSFC-EDOS** and **GES DISC** (also on EBnet) was also stable this month,.



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 (2.5 gbps) tail circuit.

1) **EROS:** (continued)

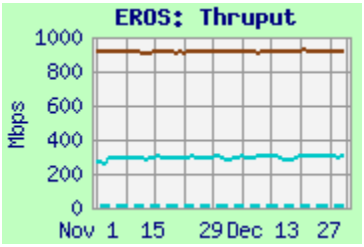
Iperf testing for comparison is performed from **GSFC-ENPL** to both LPDAAC (the "FTL" node, outside the EROS firewall) and to EROS-PTH (both 10 gig hosts). The route from **GSFC-ENPL** to EROS is from GSFC via a direct 10 gig connection to the MAX, to the Internet2 100 gbps backbone, to StarLight in Chicago, then via the EROS OC-48 (2.5 gbps) tail circuit. **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 (including reprocessing) – it would be rated **Good**. **GSFC-ENPL IPv6** tests have been failing since February 2014.

Additional Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
JSpace-ERSD→ EROS LPDAAC	315.0	302.0	205.8	10.0	302.0
JSpace → EROS PTH	330.7	191.2	87.5		
NSIDC SIDADS→ EROS PTH	922.3	919.6	876.0		
LaRC PTH→ EROS PTH	189.2	188.8	167.7		

Requirements:

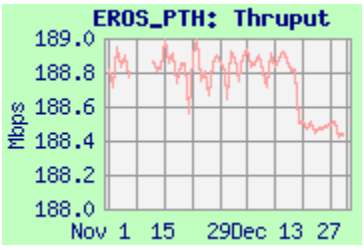
Source → Dest	Date	mbps	prev	Rating
ERSDAC → EROS	FY '06 –	8.3	8.3	Excellent



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

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

1.4 LaRC → **EROS-PTH**: The route from LaRC-PTH is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources. Performance was stable this month, similarly to the other NISN sources. Note that LaRC-PTH has a 200 mbps outflow limitation.



2) to GSFC
2.1) to NPP, GES DISC, etc.

Ratings: JPL → GSFC: Continued **Excellent**
NSIDC → GES DISC: Continued **Excellent**
LDAAC → GES DISC: Continued **Excellent**
NOAA → NPP SD3E: Continued **Low**

Web Pages:

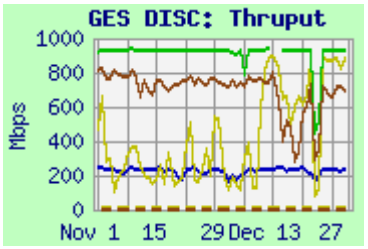
http://ensight.eos.nasa.gov/Missions/NPP/GSFC_SD3E.shtml
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtml
http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml

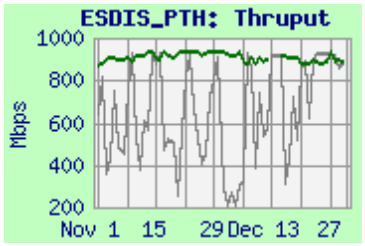
Test Results:

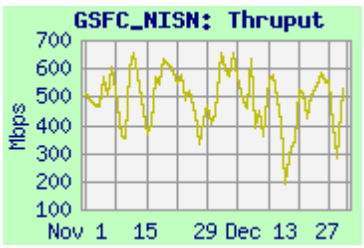
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
EROS LPDAAC → GES DISC	261.4	230.3	148.5		
EROS PTH → GSFC-ESDIS PTH	925.0	851.0	270.0		
JPL-PODAAC → GES DISC	868.9	650.2	185.9	19.3	
JPL-PTH → GSFC-NISN	715.1	499.2	111.6		
NSIDC DAAC → GES DISC	809.7	720.8	560.9	2.54	
NSIDC DAAC → GSFC-ISIPS (scp)	31.6	30.9	23.4		
LaRC ASDC → GES DISC	936.0	933.1	858.2	0.77	
LARC-ANGe → GSFC-ESDIS PTH	934.0	900.1	851.6		
NOAA-PTH → NPP-SD3E-OPS1	229.2	222.0	210.8	235.9	284.0

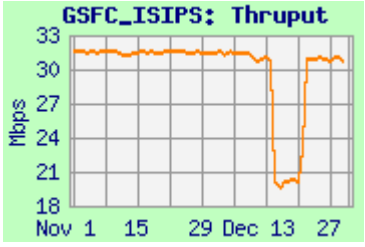
Requirements:

Source → Dest	Date	FY '15	FY '12	Rating
JPL→ GSFC combined	FY '15 –	11.9	0.57	Excellent
NSIDC → GSFC	FY '15 –	0.009	0.017	Excellent
LaRC ASDC → GES DISC	CY '12 –	0.6	0.6	Excellent
NOAA → NPP SD3E	FY '15 –	601.3	522.3	Low









Comments:

2.1.1 EROS LPDAAC, EROS-PTH → GSFC: The thruput 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.

2.1.2 JPL → GSFC: Thruput from **JPL-PODAAC** to GES DISC is noisy, but improved and stabilized in late December. Note that JPL campus nodes → EBnet flows take Internet2 instead of NISN, based on JPL routing policies. Thruput was well above 3 x the requirement, so the rating remains **Excellent**. The 19 mbps average user flow was abovet he 9 mbps last month, presumably due to OCO2 flows. It is now above the new requirement (with contingency).

Testing from **JPL-PTH** to GSFC-NISN is routed via NISN PIP, and is also noisy.

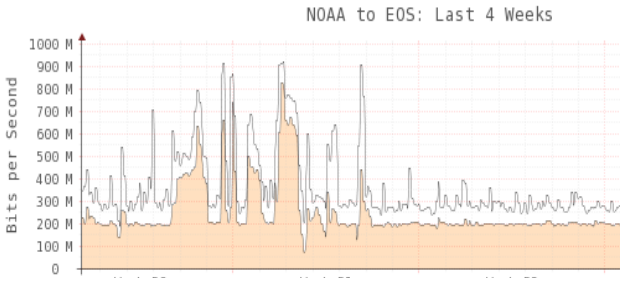
2.1.3 NSIDC → GSFC: Performance from **NSIDC** to GES DISC remained way above the tiny requirement, so the rating remains **Excellent.** The user flow was again well above both the old and lower new requirement.

Thruput to **GSFC-ISIPS** using SCP remains well above the requirement.

2.1) to NPP, GES DISC continued.

2.1.4 LaRC → GSFC: Performance from both **LaRC ASDC** to GES DISC and **LaRC ANGe** to ESDIS-PTH was very stable this month. Both results remained way above 3 x the modest requirement, so the rating continues as **Excellent**. The user flow this month was a bit above the requirement.

2.1.5 NOAA → NPP-SD3E: Performance from **NOAA-PTH** to GSFC NPP-SD3E-OPS1 dropped dramatically in early November. The user flow was close to usual, at about 40% of the requirement (with contingency), and appeared unaffected, leading to the inference that the problem was with the test node, not the network.

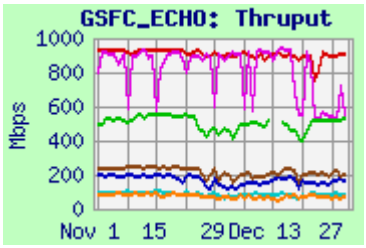


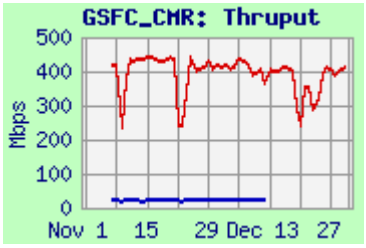
2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_ECHO.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS LPDAAC	192.5	152.6	99.5
EROS LPDAAC ftp	118.8	83.3	23.1
GES DISC	925.2	894.2	826.1
GES DISC ftp	941.2	864.9	506.3
LaRC ASDC DAAC	553.5	498.1	388.8
NSIDC DAAC	238.5	202.5	144.7
NSIDC DAAC ftp	105.3	67.6	27.6
EROS LPDAAC → CMR	45.1	22.4	15.9
GES DISC → CMR	433.2	404.8	338.1





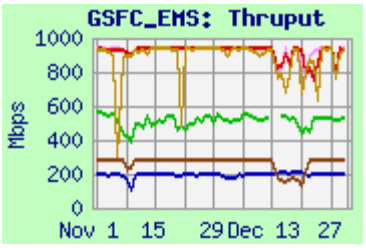
Comments: Performance was mostly stable from all sources. FTP performance is mostly limited by TCP window size – especially from sites with long RTT. Testing to the "Common Metadata Repository" (CMR), which will replace ECHO, was started in November. Performance is erratic – different server software will be tried.

2.3 GSFC-EMS: EOS Metrics System

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

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS LPDAAC	206.8	201.6	83.1
ESDIS-PTH	939.0	937.2	683.6
GES DISC	938.1	936.2	721.9
LARC ASDC	569.3	525.2	373.1
MODAPS-PDR	938.6	922.2	315.2
NSIDC-SIDADS	284.5	282.6	239.1



Comments: Testing is performed to GSFC-EMS from the above nodes, iperf only. Performance was stable from all sources.

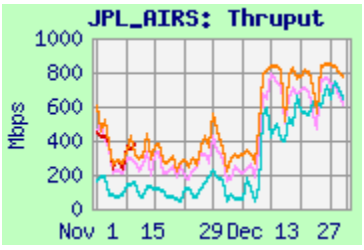
3) JPL:

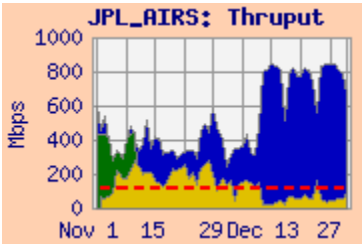
3.1) GSFC → JPL:

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

Test Results: (additional results on next page)

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
NPP-SD3E-OPS1 → JPL-AIRS	848.2	770.8	256.3	91.0	779.4
GSFC-GES DISC → JPL-AIRS	n/a	n/a	n/a		
ESDIS-PTH → JPL-AIRS	762.7	642.1	353.0		
GSFC-NISN → JPL-AIRS	780.0	524.7	58.8		
ESDIS-PTH → JPL-NISN-PTH	231.9	121.8	71.5		
NPP-SD3E-OPS1 → JPL-Sounder	844.5	736.2	217.9		
GSFC-NISN → JPL-Sounder	757.9	653.3	230.8		





Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → JPL Combined	FY '15	**121.0**	**63**	**Excellent**
GSFC → JPL AIRS	FY '15	11.4	40	**Excellent**
GSFC NPP → JPL Sounder	FY '15	15.9	15	**Excellent**
GSFC → JPL SMAP	FY '15	49.1	-	**Low**
GSFC → JPL OCO2	FY '15	36.6	-	**Excellent**
GSFC → JPL Other	FY '15	8.0	1.0	**n/a**

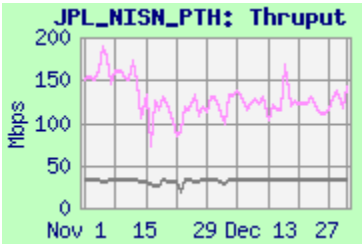
Comments: 3.1.1 AIRS , Overall:
http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

Performance from GSFC to all JPL destinations improved, stabilized, and the diurnal variation was eliminated in early December, due to moving ARC to JPL flows off NISN, and onto CENIC, thus reducing congestion on the 1 gbps connection between NISN PIP and the JPL campus .

OCO2 requirements were added in September, and SMAP requirements in October. User flow decreased this month – the 91 mbps average flow (for all EBnet to JPL flows) is consistent with the requirement, including contingency, but below the 188.6 mbps last month.

The median integrated thruput from NPP-SD3E-OPS1 to JPL-AIRS remains well above 3 x the AIRS requirement, so the AIRS rating remains **Excellent**. Performance from ESDIS-PTH and GSFC-NISN was similar. Testing from GES DISC to JPL AIRS began failing in November – fixed in January.

3.1.2 The JPL overall rating is also based on the NPP-SD3E-OPS1 to JPL AIRS thruput, compared with the sum of all the GSFC to JPL requirements. The median thruput improved to now be well above 3 x this requirement, so the overall rating remains **Excellent**.

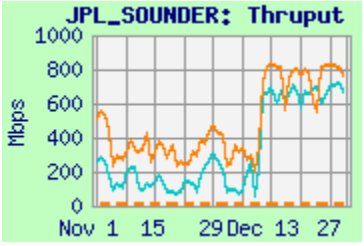


3.1.3 ESDIS-PTH to JPL-NISN-PTH:
http://ensight.eos.nasa.gov/Organizations/daac/JPL_NISN_PTH.shtml

The thruput from ESDIS-PTH to JPL-NISN-PTH is stable, and never did exhibit diurnal variation, supporting the conclusion that the congestion was between NISN and the JPL campus.

3.1.4 NPP to JPL Sounder:
http://ensight.eos.nasa.gov/Missions/NPP/JPL_SOUNDER.shtml

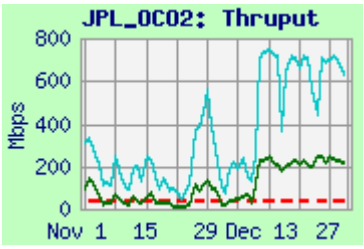
Performance from NPP-SD3E-OPS1 and GSFC-NISN improved and stabilized along with the other GSFC to JPL flows. Thruput was well above the requirement rating **Excellent**.



3.1) GSFC → JPL: continued

Test Results: continued

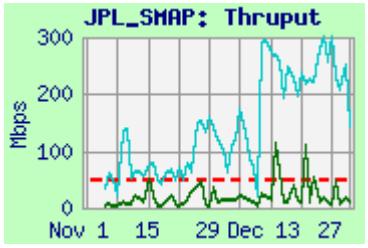
Source → Dest		Medians of daily tests (mbps) Best	Median	Worst	Requirement (mbps)	Rating
GSFC-EDOS → JPL-OCO2	1 stream	250.5	206.7	17.7	36.6	↑ Excellent
	6 streams	767.4	643.3	172.0		Excellent
GSFC-EDOS → JPL-SMAP	1 stream	120.7	14.0	3.6	49	Bad
	6 streams	440.2	220.8	39.9		↑ Excellent
ESDIS-PTH → JPL-MLS		508.8	490.3	359.6		
GSFC-NISN → JPL-MLS		533.0	520.8	503.6		
ESDIS-PTH → JPL-PODAAC		577.8	573.8	304.1		
GSFC-NISN → JPL- PODAAC		793.3	789.4	665.7		
ESDIS-PS → JPL-QSCAT		93.0	92.7	91.6		
GSFC-NISN → JPL-QSCAT		74.9	73.1	67.7		



3.1.5 OCO2:

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

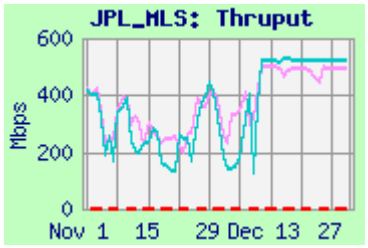
OCO-2 was launched July 2! Testing from **EDOS** to OCO2 is done using both a **single stream** and **6 streams**. Performance improved and stabilized in early December, along with the other GSFC to JPL flows. Thruput from EDOS (using both single stream and 6 streams) is rated **Excellent**.



3.1.6 SMAP:

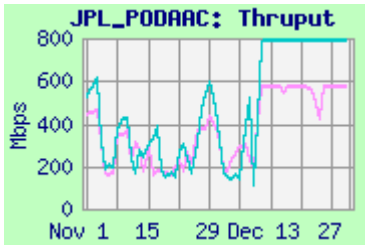
http://ensight.eos.nasa.gov/Organizations/daac/JPL_SMAP.shtml

The 49 mbps requirement from GSFC to JPL SMAP began in October, before the planned SMAP launch in January. Testing from **EDOS** to SMAP is done using both a **single stream** and **6 streams**. Performance stabilized in early December, along with the other GSFC to JPL flows. The rating improves to **Excellent** with 6 streams, but remains **Bad** with a single stream.



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

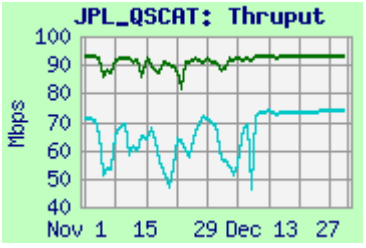
Thruput from both **ESDIS-PTH** and **GSFC-NISN** also stabilized in early December, and was way above the modest 1.2 mbps requirement, so the rating remains **Excellent**.



3.1.8 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 also stabilized in early December. Thruput was way above the previous 1.5 mbps PODAAC requirement.



3.1.9 QSCAT:

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

There is no longer a requirement from GSFC to JPL QSCAT in the database. Thruput from **ESDIS-PS** and **GSFC-NISN** to QSCAT also stabilized in early December. Thruput from both remained well above the modest previous 0.6 mbps requirement.

3.2) LaRC → JPL

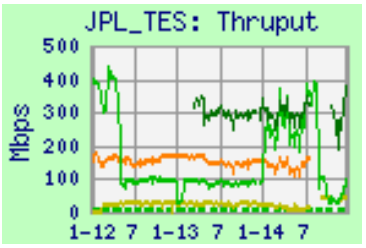
Rating: ↑ **Good** → **Excellent**

Web Pages:

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

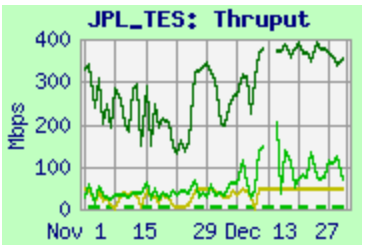
Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
LaRC ANGE → JPL-TES	448.2	356.7	104.8	
LaRC ASDC → JPL-TES	208.5	70.9	10.4	
LaRC ANGE → JPL-PTH	306.4	260.2	30.5	13.3
LaRC PTH → JPL-PTH	185.5	185.3	153.6	

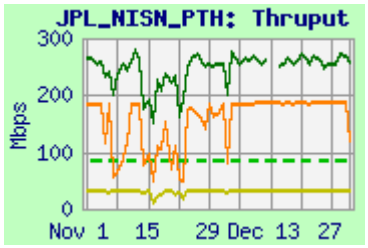


Requirements:

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

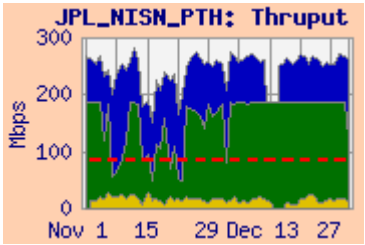


3.2.1 LaRC→ JPL (Overall, TES): Performance from LaRC ASDC to JPL TES dropped dramatically in mid August. Performance from both **LaRC ASDC** and **LaRC ANGe** improved and stabilized in early December, like other NISN flows to JPL. **LaRC ASDC** to JPL-TES had improved dramatically in early January 2014 with the ASDC node upgrade!



The LaRC to JPL Overall rating is now based on the performance from **LaRC ANGe** to JPL-TES, since it more accurately shows the network capability. The median thruput improved to more than 3 x the combined requirements, so the overall rating improves to **Excellent**. Total LaRC to JPL user flow is about 24% of the requirement (without contingency).

The median thruput from **LaRC ASDC** to JPL-TES remained well over 3 x the TES requirement, so the TES rating remains **Excellent**. User flow to TES is very low.



3.2.2 LaRC→ JPL-PTH: Performance from **LaRC ANGe** to JPL-PTH was much more stable than **LaRC ASDC** to JPL-TES – degradation had previously been present, but less severe that to nodes inside the JPL campus. JPL-PTH is directly connected to the NISN router, so it was not affected by the congestion between NISN and the JPL campus. Performance from **LaRC-PTH** stabilized a bit below its 200 mbps limitation.

3.2) LaRC → JPL (continued)

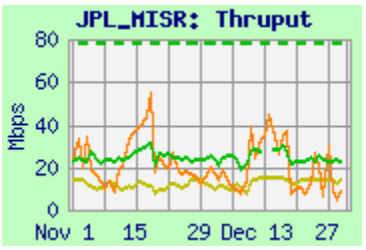
3.2.3 LaRC → JPL-MISR: http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

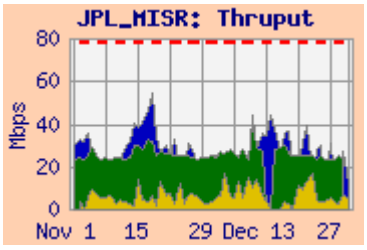
Test Results:

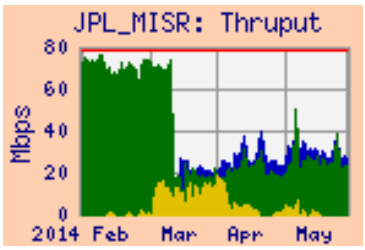
Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
LaRC ASDC → JPL-MISR	39.5	23.8	2.0	
LaRC PTH → JPL-MISR	53.3	14.0	0.8	5.7

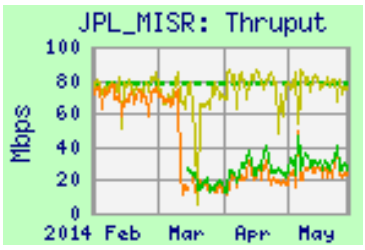
Requirements:

Source → Dest	Date	Mbps	Prev	Rating
LaRC ASDC → JPL-MISR	CY '12 –	78.1	62.3	Bad









Performance from **LaRC ASDC** to JPL-MISR is similar to that from **LaRC PTH,** limited by the Fast-E connection to the MISR node. Thruput to MISR from both sources dropped severely in March 2014, after improving in December 2013.

The median integrated thruput from **LaRC ASDC** remained a bit below 1/3 the MISR requirement, so the MISR rating remains **Bad**. User flow was about the same as last month, and averaged only about 11% of the requirement, without contingency.

Note that there was a user flow peak, beginning in late February 2014, 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

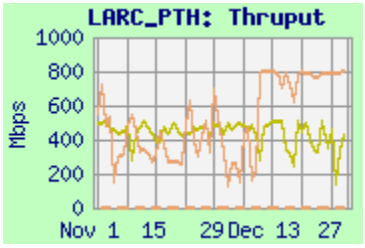
4.1) JPL → LaRC

Rating: Continued **Excellent**

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

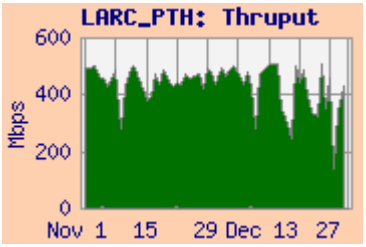
Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
JPL-PTH → LaRC PTH	513.0	456.0	70.9	0.78
JPL-TES → LaRC PTH	805.3	783.7	205.4	



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, performance from JPL-TES to LaRC-PTH improved and stabilized, due to the ARC to JPL flows being diverted away from NISN. The thruput remained much higher than the requirement; the rating remains **Excellent**.

Thruput from JPL-NISN-PTH to LaRC-PTH increased at the beginning of June 2014, when JPL-NISN-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 thruput was stable this month, as JPL-NISN-PTH is not subject to NISN to JPL campus congestion.

Thruput from both JPL sources to LaRC-PTH increased again in September, when LaRC-PTH was upgraded.

The JPL to LaRC integrated graph shows the 0.78 mbps user flow from JPL to LaRC this month. This is the entire NISN flow from JPL to LaRC – it may not all be EOS related. But it is consistent with the EOS requirement.

4.2) GSFC → LaRC:

Rating: Continued **Excellent**

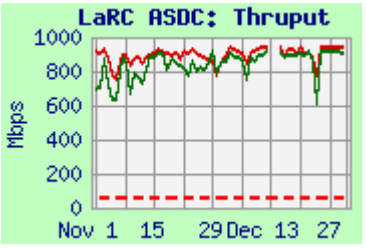
Web Pages : http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

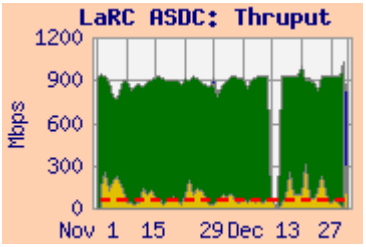
Test Results:

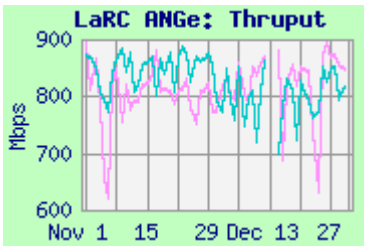
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GES DISC → LaRC ASDC	936.3	926.4	687.7	52.4	928.7
GSFC-EDOS → LaRC ASDC	925.6	895.4	523.1		
ESDIS-PTH → LaRC-ANGe	910.9	844.6	634.6		
GSFC-NISN → LaRC-ANGe	894.9	803.7	513.5		
GES DISC → LaRC-PTH	939.1	842.9	615.2		
GSFC-NISN → LaRC-PTH	929.6	824.0	686.3		
NPP-SD3E → LaRC-PTH	924.3	817.5	601.4		

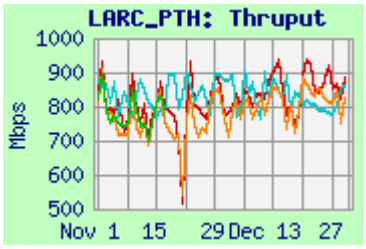
Requirements:

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.

As seen on the integrated graph, the 54 mbps average user flow this month was close to both 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** improved from all sources in late September when the LaRC-PTH node was upgraded. (Note the expanded scale on the graph). Performance is now similar to ASDC and ANGe.

5) Boulder CO sites:

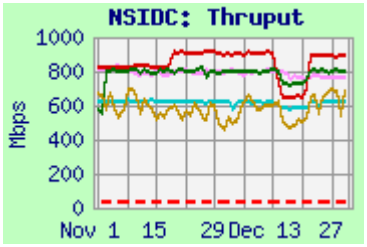
5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
GHRC → NSIDC: Continued **Good**
JPL → NSIDC: **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_PTH.shtml

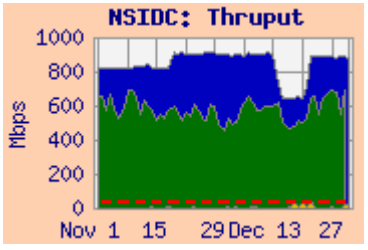
Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS-PDR → NSIDC DAAC	751.1	578.8	222.8	7.4	579.0
GES-DISC → NSIDC DAAC	912.7	891.4	632.5		
GSFC-EDOS → NSIDC DAAC	848.2	799.7	556.5		
ESDIS-PTH → NSIDC DAAC	822.2	779.6	623.7		
GSFC-ISIPS → NSIDC (iperf)	630.6	619.8	421.3		
JPL SMAP → NSIDC DAAC	813.0	744.0	346.0	0.36	
GHRC → NSIDC DAAC (nuttcp)	39.6	10.8	3.7	0.012	
GHRC → NSIDC DAAC (ftp pull)	10.6	8.2	2.3		



Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → NSIDC	8/14 –	38.5	16.8	Excellent
JPL → NSIDC	FY '15 –	17.1	0.16	Excellent
GHRC → NSIDC	FY '15 –	5.14	2.08	Good

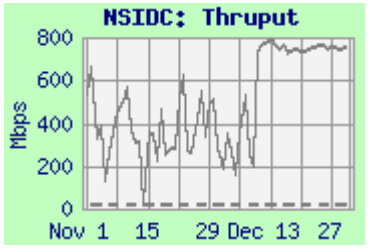


Comments: The requirements were updated in June to use the FY '14 database. AMSR-E flows from EDOS and JPL have been removed. **The MODIS reprocessing flow requirement is now effective, although the actual flow has apparently not begun.**

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 thruput from **MODAPS-PDR** remained well above 3 x the increased requirement, so the rating remains **Excellent**. The 7.4 mbps average user flow was well below the requirement – without MODIS reprocessing or contingency.

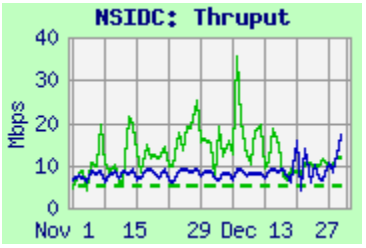
Performance from **GES-DISC**, **GSFC-EDOS**, and **GSFC-ISIPS** was less noisy and mostly stable.

5.1.2 JPL SMAP → NSIDC S4PA: There is no longer a JPL to NSIDC requirement for AMSR-E. A new 17.1 mbps flow for SMAP began in October.



Testing to NSIDC from **JPL-SMAP** was well in excess of the SMAP requirement, rating **Excellent**. Thruput stabilized in December, like many other JPL flows. The user flow was only 0.36 mbps this month -- well below the requirement, and below the 2.9 mbps last month.

5) Boulder CO sites (Continued):

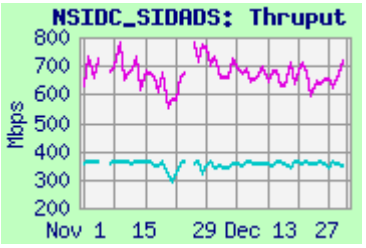


5.1.3 **GHRC, GHRC-ftp → NSIDC S4PA:** GHRC (NSSTC, UAH, Huntsville, AL) sends reprocessed AMSR-E data to NSIDC via Internet2. This requirement increased to 5.14 mbps last month (was 2.08 mbps previously) – when the next reprocessing campaign begins.

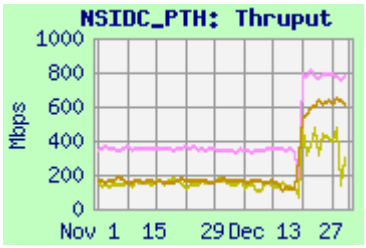
The median integrated thruput was again above the increased requirement, but no longer by 3 x, so the rating remains **Good**

Test Results: NSIDC-SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	786.0	662.0	507.0
GSFC-NISN → NSIDC-SIDADS	364.5	358.7	271.1
ESDIS-PTH → NSIDC-PTH	422.2	349.4	291.4
MODAPS-PDR → NSIDC-PTH	264.0	168.2	141.2
JPL-NISN-PTH → NSIDC-PTH	233.3	148.5	64.5



5.1.4 GSFC → NSIDC-SIDADS: Performance from GSFC-ENPL was retuned in June (using 30 streams, to compensate for the small window size on SIDADS) with increased thruput. Testing from GSFC-NISN was similarly retuned in September.



5.1.5 NSIDC-PTH: Thruput from GSFC sources to NSIDC-PTH improved in mid December, when the NSIDC-PTH machine was upgraded.

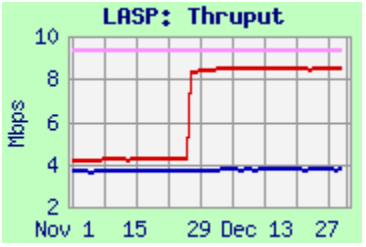
5.2) LASP:

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

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

Test Results:

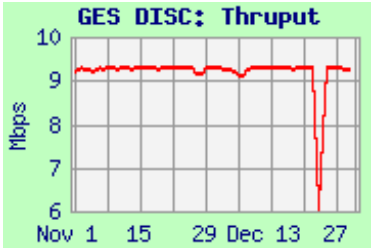
Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (scp)	3.78	3.75	3.53
ESDIS-PTH → LASP blue (iperf)	9.39	9.38	8.04
GES DISC → LASP blue (iperf)	8.52	8.50	7.46
LASP → GES DISC	9.31	9.30	7.85



Requirement:

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

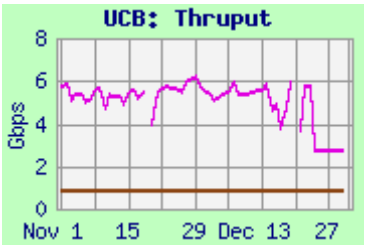
Comments: In January '11, LASP's connection to NISN PIP was rerouted to a 10 mbps connection to the NISN POP in Denver; previously it was 100 mbps from CU-ITS via NSIDC.



Thruput recovered in late November with retuning, after dropping in mid-October. Previously, iperf testing from **GES DISC** had been very stable since February 2013, when it improved with the GES DISC firewall upgrade.

Iperf and **SCP** testing from ESDIS-PTH was very stable, and consistent with the circuit limitation, as was return testing from **LASP** to GES DISC, rating **Excellent**.

5.3) UCB: http://ensight.eos.nasa.gov/Organizations/daac/UCB.shtml



Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL	6375.4	5295.1	2608.4
GSFC-ESTO	856.0	844.5	729.0

Comments: Thruput from both GSFC-ENPL and GSFC-ESTO improved in early October, by switching back to the 10 gig connected test node at UCB (it had began failing consistently in mid-May 2013, so testing had been switched to a 1 gig test node in mid-June '13). The route is via Internet2 to FRGP, similar to NCAR.

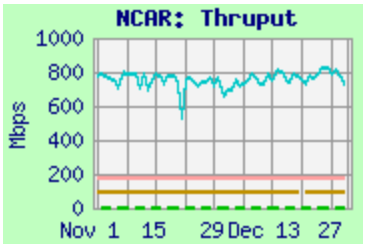
5.4) NCAR:

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

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

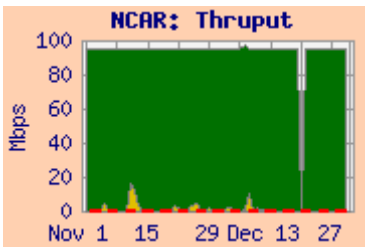
Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC PTH	181.8	181.3	176.1
GSFC-ENPL-10G	5270.6	4266.0	1576.3
GSFC-ENPL-FE	95.6	95.4	95.0
GSFC-NISN	858.0	754.6	416.8



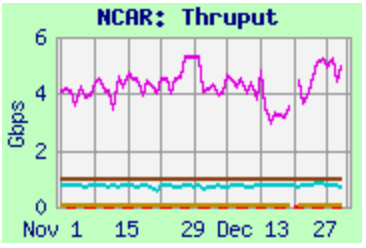
Requirement:

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 is to NCAR's 10 gigabit capable PerfSonar node since March '12.

From LaRC: Thruput from LaRC-PTH was very steady, and improved a bit with the LaRC-PTH upgrade in September. It remains limited to 200 mbps by agreement with CSO / NISN. The median remained well above 3 x the tiny requirement, so the rating remains **Excellent**.



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**. The user flow from GSFC-EBnet averaged about 1.3 mbps this month, below the 1.8 mbps last month. This is well above the revised requirement, but closer to the previous requirement.

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 noisy, but averages over 4 gbps, and gets over 5 gbps on peaks.

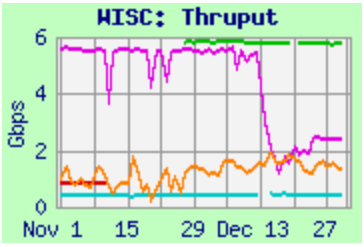
6) Wisconsin:

Rating: Continued **Excellent**

Web Pages http://ensight.eos.nasa.gov/Missions/NPP/WISC.shtml

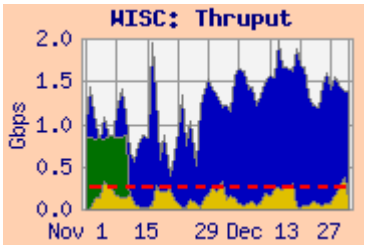
Test Results:

Source Node	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
NPP-SD3E	1716.4	1458.3	970.0	158.4	1461.5
GES DISC	n/a	n/a	n/a		
GSFC ENPL	6451.0	5459.6	2766.0		
GSFC-ENPL-v6	5889.6	5826.5	3949.7		
LaRC ANGe	503.1	448.1	310.1		



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: Testing from NPP-SD3E was switched to Wisconsin's 10 gig server in May 2013, with initial thruput usually close to 2 gbps! There was a significant performance drop in mid-October (but improved again in December). The median integrated thruput from NPP-SD3E remained above the NPP requirement by more than 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**.

User flow was consistent to the requirement, similar to last month.

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

Testing from GSFC-ENPL was switched to the 10 gig server at Wisconsin (SSEC) in March 2013. Due to problems, testing was switched to a backup server in September, with reduced results, back to the 10 gig server in early October, and to the backup server again in December.

Testing from **GSFC-ENPL** using IPv6 was added in late November. It's performance was stable and slightly better than IPv4 performance.

Testing from **GES DISC** began failing in November, and was restored in January.

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.

7) KNMI:

Rating: Continued **Excellent**

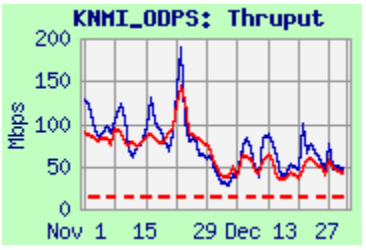
Web Page http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml

Test Results:

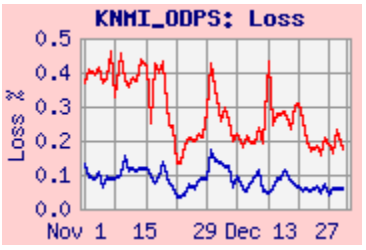
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
OMISIPS → KNMI-ODPS	82.6	44.7	32.4	1.8	45.0
GSFC-ENPL → KNMI-ODPS	158.0	49.3	28.1		

Requirements:

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

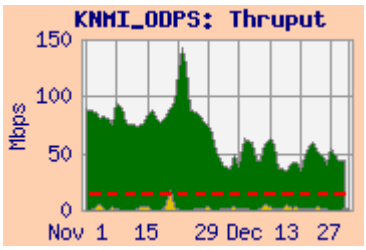


Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 2+ x 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam.

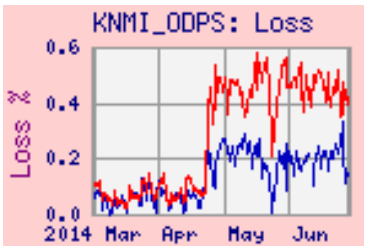


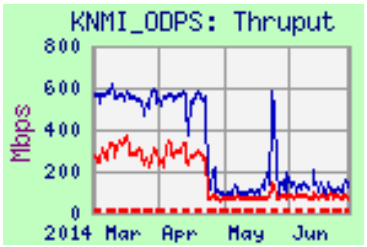
The requirement was increased with the use of the database to 13.4 mbps, a much more realistic value than the previous 0.03 mbps.

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 2014, when it dropped significantly, due to increased packet loss. But the median thruput remains slightly above 3 x the increased requirement, so the rating remains **Excellent**.



The user flow, however, averaged only 1.8 mbps this month, similar to recent months, but only 13% of the revised requirement.





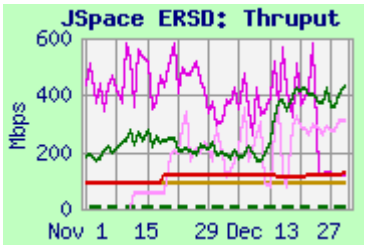
8) JSpace - ERSD:

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)				
	Best	Median	Worst	User Flow	Integrated
GSFC-EDOS → JSpace-ERSD	460.6	358.3	119.9	4.8	360.2
GES DISC → JSpace-ERSD	126.3	120.6	57.9		
GSFC ENPL (FE) → JSpace-ERSD	92.0	91.9	91.6		
GSFC ENPL (GE) → JSpace-ERSD	583.0	353.0	61.0		
GSFC ESDIS-PTH → JSpace-New	420.1	276.2	65.0		
JSpace-ERSD → EROS	315.0	302.0	205.8	10.0	302.0
JSpace-New → EROS-PTH	330.7	191.2	87.5		
JSpace-ERSD → JPL-TES	191.8	83.6	16.5		



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

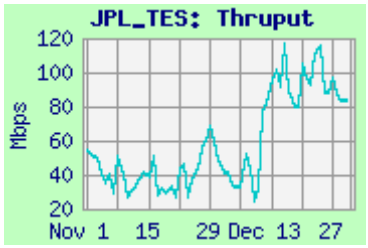
Comments: **8.1 GSFC → JSpace-ERSD:** The median thruput to JSpace-ERSD from most sources improved in September 2011, when the connection from JSpace-ERSD to Tokyo-XP was upgraded to 1 gbps (from 100 mbps).

Median integrated thruput from **GSFC-EDOS** was well above 3 x the increased requirement, so the rating remains **Excellent**. The 4.8 mbps user flow from GSFC to JSpace-ERSD was a little below normal this month, and also below the increased requirement without contingency.

Thruput from **GSFC ENPL** was also noisy, but averaged over 350 mbps.

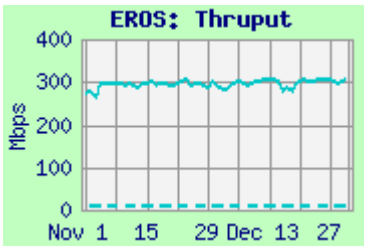
Testing to a new server at ERSD was initiated from ESDIS-PTH in November, and retuned later in the month. Performance was lower than to the existing node, but would still be rated **Excellent**.

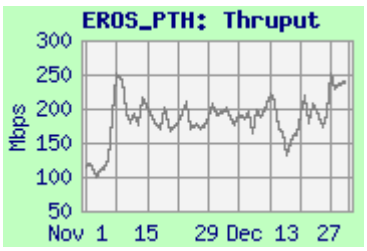
8.2 JSpace-ERSD → JPL-ASTER-IST: The JPL-ASTER-IST test node was retired in October 2012. JPL no longer uses a distinct IST; instead, JPL personnel log in directly to the IST at JSpace-ERSD. As a substitute, testing was initiated from ERSD to a different node at JPL ("TES"). Results to TES improved,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



8.3 JSpace-ERSD → EROS: Thruput was very stable and remains well above the requirement, so the rating remains **Excellent**. The 10 mbps user flow this month was above the requirement, with contingency.

Testing from the new server at **JSpace** was initiated to EROS-PTH in October. Performance was lower than from the existing node, but would still be rated **Excellent**.





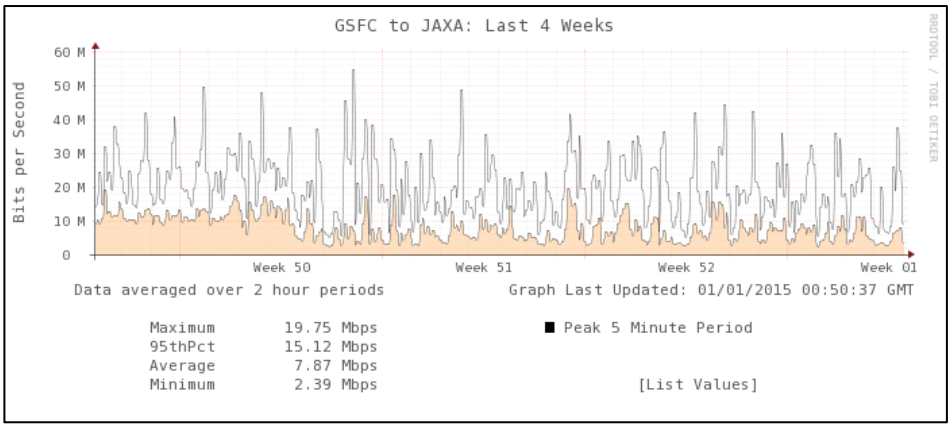
10) GSFC ←→ JAXA

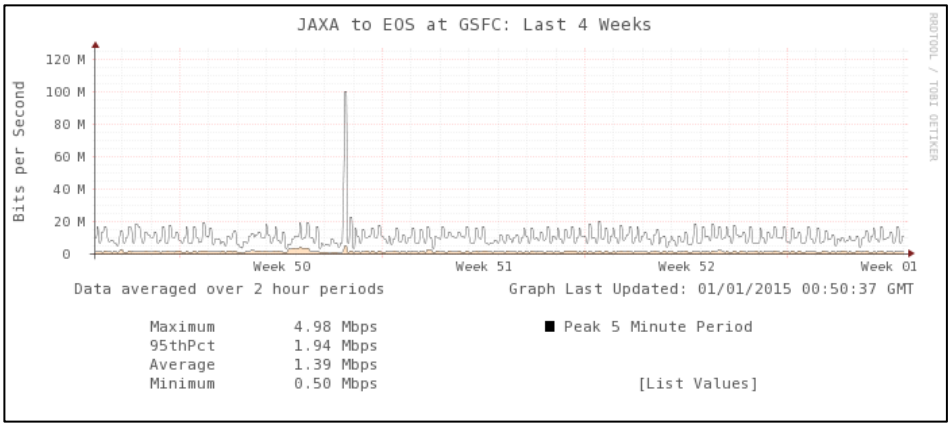
Ratings: GSFC → JAXA: N/A
JAXA → GSFC: N/A

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009. No additional testing is planned for AMSR or TRMM. All testing to JAXA-TKSC for ALOS was terminated at the end of June '09. Tests have been conducted with JAXA to evaluate different file transfer protocols for GPM -- but those results are not suitable for this report.

However, the user flow between GSFC-EBnet and JAXA continues to be measured. As shown below, the user flow this month averaged 7.9 mbps from GSFC-EBnet to JAXA, and 1.4 mbps from JAXA to GSFC-EBnet.

These values are more or less consistent with the new database requirements of 15.4 mbps from GSFC to JAXA, 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 from GSFC to JAXA. Performance to the Tokyo-XP 10 gig server, is well in excess of the JAXA requirements.