

EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the 1st quarter of 2014 -- comparing the performance against the requirements, including Terra, TRMM, QuikScat, Aqua, Aura, ICESat, NPP, and GEOS requirements.

There are still sites with requirements, but are not tested: University of Washington, JRC (Ispra, Italy), JAXA (Japan).

Current results can be found on the EOS network performance web site (ENSIGHT): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the site links below.

Highlights:

- Performance was mostly stable
 - **All but one node rated Excellent!** (GSFC → GHRC **Good**)
 - **GPA 3.93** (same as last quarter)

Ratings:

Rating Categories:

Excellent: median of daily worst cases > 3 x requirement

Good: median of daily worst cases > requirement

Adequate: median of daily worst cases < requirement
and
median of daily medians > requirement

Almost Adequate: requirement > median of daily medians > requirement / 1.5
(i.e., median thrupt is below requirement, but above requirement without contingency)

Low: median of daily medians < requirement / 1.5.

Bad: median of daily medians < requirement / 3.

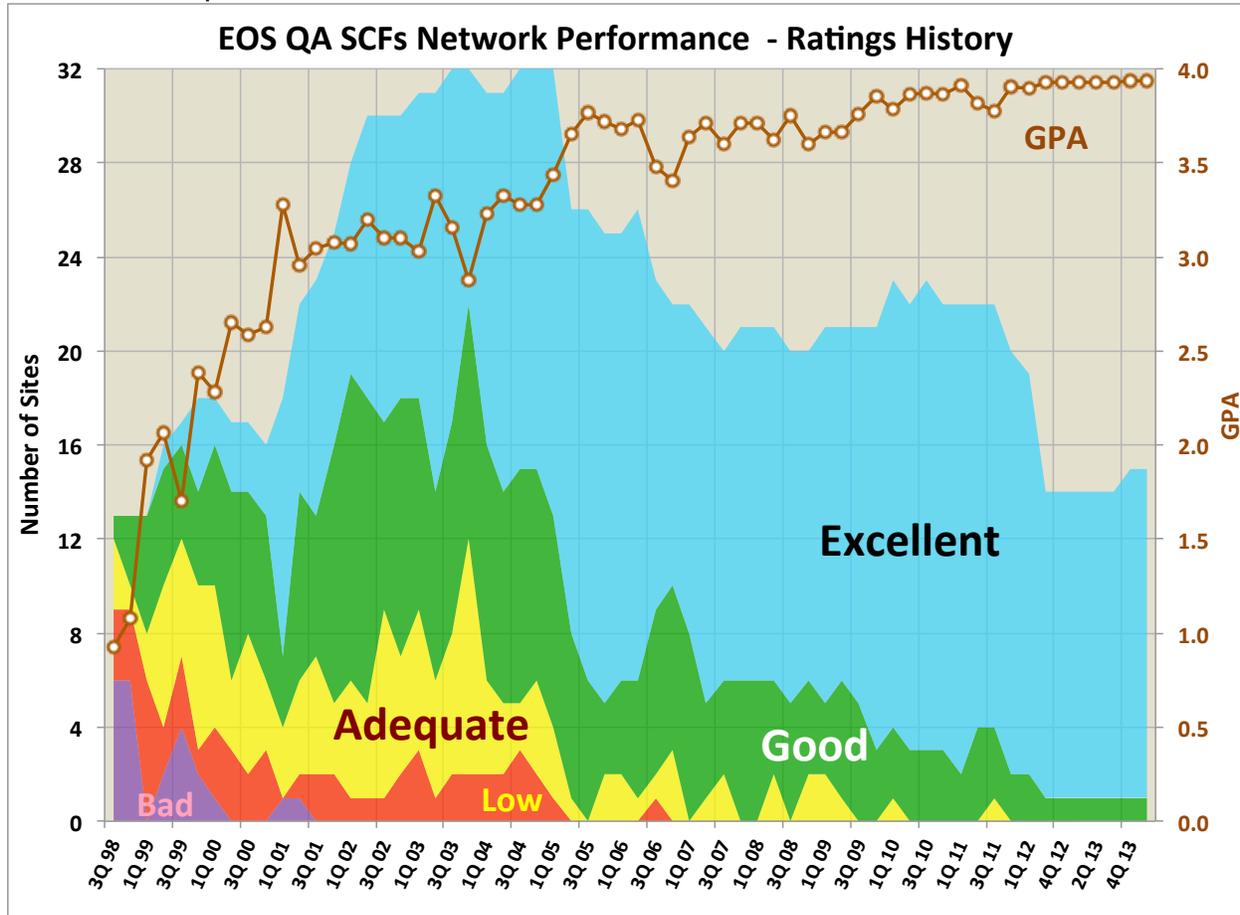
Ratings Changes:

Upgrades: ↑ None

Downgrades: ↓ None

Ratings History:

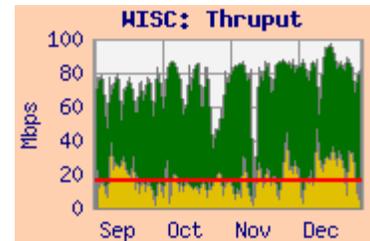
The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Notes: The number of sites included in this chart has changed since 1Q'05 due to:

- 2Q05: Moving the reporting for 6 SIPS sites to the “EOS Production Sites” Network Performance Report.
- 2006: Testing discontinued to SAGE III Nodes, NOAA, UMD, UIUC
- 2Q07: Testing discontinued to U Washington
- 1Q09: Testing added to BADC (RAL).
- 2010: Testing to Oxford restored, ICESAT functions of Ohio State were transferred to Buffalo, testing to Buffalo added, Testing to Ohio State discontinued.
- 3Q10: UIUC added [back]; Testing to MIT discontinued
- 2Q11: Testing discontinued to LANL, PNNL; requirements added to CCRS and Univ of Auckland
- 4Q11: Testing to JRC discontinued, Wisconsin moved to production sites report.
- 1Q12: Testing to Univ Auckland, NZ failing.
- 2-3Q12: Discontinued testing to Arizona, UCSD, Colo State, Miami, Montana, SUNY SB, and Buffalo – no longer any requirements. Added testing to Hawaii, ORNL.
- 4Q13: Testing to Auckland, NZ restored.

Integrated Charts: Integrated charts are included for selected sites with the site details. These charts are “Area” charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC/EBnet, in this example) to the destination facility (e.g., Wisconsin, 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 thruptut between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.



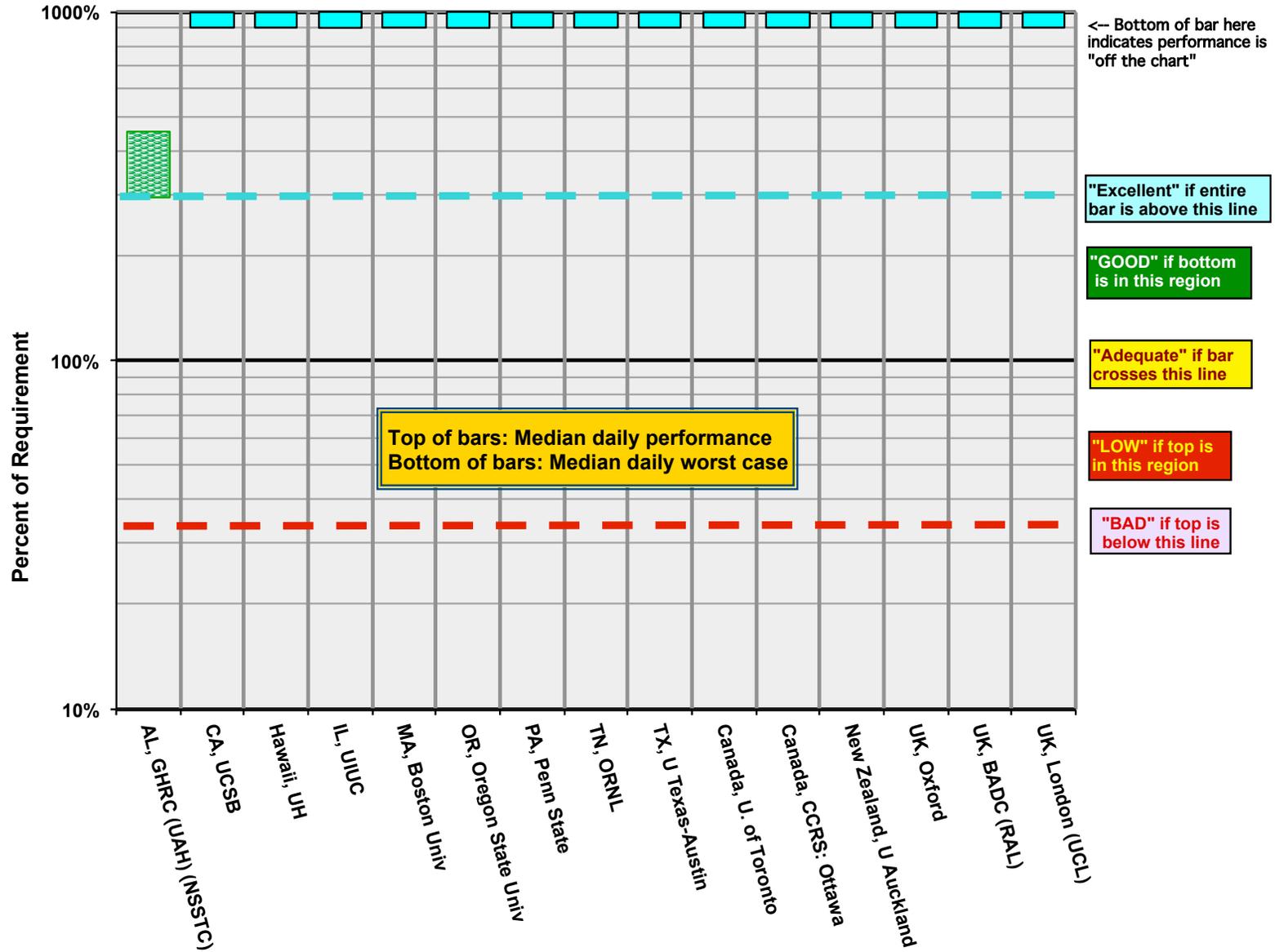
Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs. (But JPL ← → LaRC flow data is available from JPL, and GSFC/EBnet ← → LaRC is available from EBnet).

EOS QA SCF Sites Summary: Network Requirements vs. Measured Performance

1 st Quarter 2014				Testing							
Destination	Team (s)	Requirements		Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		Route Tested
		Database	Nov-07						1Q 2014	4Q 2013	
AL, GHRC (UAH) (NSSTC)	MODIS, LANCE	2.9	6.9	GSFC-MODIS	13.6	13.2	8.5	9.9	Good	Good	MAX - Internet2 - SOX - UAH
CA, UCSB	MODIS	0.17	3.1	GSFC-MODIS	146.2	143.7	132.4	0.8	Excellent	Ex	EBnet - MAX - Internet2 - CENIC
Hawaii, UH	MODIS	0.02		GSFC-ENPL	2148.2	2120.4	1957.6	3.6	Excellent	Ex	EBnet - MAX - Internet2 - LA
IL, UIUC	MISR	0.56	1.1	LaRC PTH	180.7	177.6	169.4		Excellent	Ex	NISN - MAX - Internet2 - StarLight (Chicago)
MA, Boston Univ	MODIS, MISR	2.6	3.0	EROS-PTH	700.5	268.0	50.7	1.67	Excellent	Ex	StarLight (Chicago) - Internet2 - NOX
OR, Oregon State Univ	CERES, MODIS, MISR	0.7	7.6	LaRC ANGe	97.9	96.7	94.6		Excellent	Ex	NISN - MAX - Internet2 - PNW
PA, Penn State	MISR	0.6	2.6	LaRC PTH	58.4	56.0	44.1		Excellent	Ex	NISN - MAX - 3ROX
TN, ORNL	MODIS	10.1		GSFC-ENPL	4420.9	4321.1	2436.8		Excellent	Ex	MAX - ESnet
TX, U Texas-Austin	MODIS	0.7	11.1	GSFC-ESDIS-PTH	555.8	508.2	479.6	0.1	Excellent	Ex	NISN - MAX - Internet2 - TX-learn
WA, U Washington	MISR	2.4	2.4		n/a	n/a	n/a				Internet2 via NISN / MAX
Canada, U. of Toronto	MOPITT, GEOS	0.1	0.6	LaRC ASDC	341.3	174.4	52.3		Excellent	Ex	NISN - StarLight (Chicago) - CA*net
Canada, CCRS: Ottawa	CEOS, MODIS	1.1	3.8	GSFC-MODIS	116.1	114.8	106.7	2.9	Excellent	Ex	EBnet - MAX - Internet2 - CA*net
Italy, Ispra (JRC)	MISR	9.7	0.1		n/a	n/a	n/a				NISN / MAX / Géant (DC) / GARR
Japan, JAXA	MODIS, PPS	3.5	0.5		n/a	n/a	n/a				EBnet - MAX - Internet2 - LA - TransPAC
New Zealand, U Auckland	MISR	0.3	0.3	LaRC PTH	166.1	144.9	71.0		Excellent	Ex	NISN - StarLight (Chicago) - I2 - Reannz
UK, Oxford	HIRDLS	0.4	0.5	GSFC-ENPL-PTH	907.7	703.9	538.4	0.6	Excellent	Ex	MAX - Géant (DC) - JAnet
UK, BADC (RAL)	HIRDLS	0.2	0.2	GSFC-ESDIS-PTH	30.8	23.3	13.8	0.1	Excellent	Ex	EBnet - MAX - Géant (DC) - JAnet
UK, London (UCL)	MISR, MODIS	0.6	1.0	LaRC PTH	33.8	28.1	14.7		Excellent	Ex	NISN - MAX - Géant (DC) - JAnet
								Summary			
		*Rating Criteria:								Current:	Prev
										1Q 2014	Report
										Rating	
										Excellent	14
										Good	1
										Adequate	0
										LOW	0
										BAD	0
										Total	15
										GPA	3.93

EOS QA SCF Sites

Daily Median and Worst Performance as a percent of Requirements



Details on individual sites:

Each site listed below is the DESTINATION for all the results reported in that section. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

1) AL, GHRC (UAH) (aka NSSTC)

Teams: AMSR, MODIS, LANCE

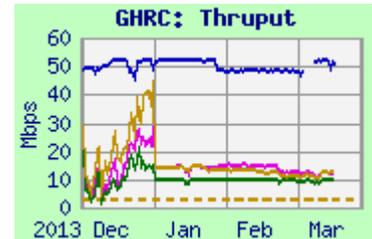
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml>

Rating: Continued **Good**

Domain: nsstc.uah.edu

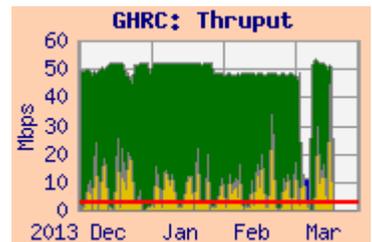
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
MODAPS-PDR	13.6	13.2	8.5	MAX / I2 / SOX
GSFC-EDOS	14.6	14.1	8.5	
GSFC-EDOS	49.5	48.8	41.7	NISN / MSFC
LaRC-PTH	10.0	9.9	6.1	NISN / MAX / I2 / SOX



Requirements:

Source Node	FY	Mbps	Rating
MODIS	'12 –	2.9	Good



Comments: Testing was initiated in December '10 from GSFC-EDOS via both **NISN** and **Internet2** for LANCE flows. Testing from **MODAPS-PDR** via I2 was initiated in November '12, returned in June, and is used as the basis for the rating.

Thruput to the UAH address from the 3 sources to was mostly similar, **but dropped significantly around 1 January**. The median daily worst case from **MODAPS-PDR** via I2 was above the MODIS requirement, but by less than 3 x so the rating remains **Good**.

Performance from **EDOS via NISN** was higher and much steadier than **EDOS via UAH**, and did not have a corresponding drop.

User flow is measured for GSFC to GHRC, combined for the NISN and UAH addresses (Both paths have significant user flows), as shown on the Integrated graph. **The average user flow this quarter was 9.9 mbps – over 3 x the requirement (again)!**

Notes:

- **This testing has been discontinued in mid March – on request from the NSSTC POC**
 - And will not be included in this report in the future
- There is no longer a CERES requirement from LaRC (was 6.9 mbps).
- Testing between GHRC, RSS and NSIDC for AMSR-E (Aqua) is now in the “Production Sites” report.

2) CA, UCSB :

Ratings: GSFC: Continued **Excellent**

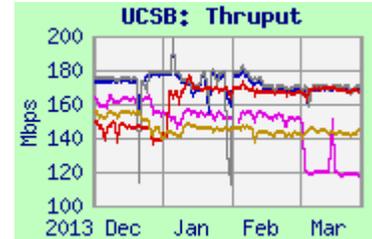
Teams: MODIS

Domain: ucsb.edu

Web page: <http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml>

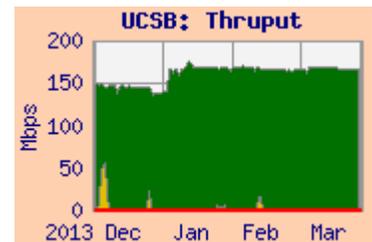
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	146.2	143.7	132.4	MAX / I2 / CENIC
GSFC-GES DISC	169.2	167.8	157.5	
GSFC-ENPL	155.0	152.0	137.7	
EROS-LPDAAC	169.4	168.8	156.8	StarLight / I2 / CENIC
EROS-PTH	171.0	170.0	131.6	



Requirements:

Source Node	FY	kbps	Rating
GSFC	'12 -	170	Excellent



Comments: The GSFC requirement was reduced (was 3.1 mbps), and the EROS requirement was eliminated (was 2.2 mbps) in the database.

Thruput from most sites is very stable. The rating from **GSFC-MODIS** remains **Excellent**. The user flow from GSFC averaged 0.84 mbps this period, about half of last quarter, but still above the new requirement. The user flow from **EROS-LPDAAC** averaged 0.18 mbps this period, well below the old requirement. Performance from **GSFC-ENPL** dropped in March. Note the expanded scale on the graph.

3) HI, University of Hawaii:

Ratings: GSFC: Continued **Excellent**

Team: MODIS

Domain: uhnet.net

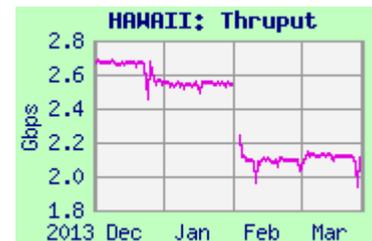
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/HAWAII.shtml>

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	2148.2	2120.4	1957.6	MAX / I2 / LA / UHnet

Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 -	21	Excellent



Comments: Testing was initiated to a PerfSonar node at UH in April '12, based on a [very small] MODIS requirement in the new ICD. Performance from **GSFC-ENPL** improved in April '13 when testing was switched to use its 10 gig interface to a 10 gig PerfSonar node at the University of Hawaii.

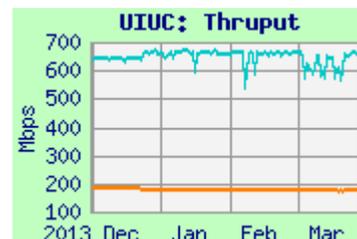
The thrupt is much more than the tiny requirement (by a factor of 100,000!), so the rating remains **Excellent**

4) IL, UIUC:

Teams: MISR

Web page: <http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml>Rating: LaRC: **Excellent**
Domain: uiuc.edu**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	180.7	177.6	169.4	NISN / StarLight / I2
GSFC-NISN	680.7	659.3	228.7	MAX / I2

**Requirements:**

Source Node	FY	kbps	Rating
LaRC ASDC	'12 -	556	Excellent

Comments: Testing was added to UIUC in August '10. Initially, SCP testing was initiated from GSFC and LaRC, sending files to UIUC. SCP thrupt was noisy from both sources, and somewhat bimodal.

In March 2012, testing from **GSFC-NISN** and **LaRC PTH** was switched to a PerfSonar server at UIUC, with greatly improved thrupt. The SCP tests were discontinued in May 2012. The thrupt to the PerfSonar server was well above the revised requirement (which was 1.1 mbps previously); the rating remains **Excellent**. Note that outflow from **LaRC PTH** is limited to 200 mbps by agreement with CSO / NISN.

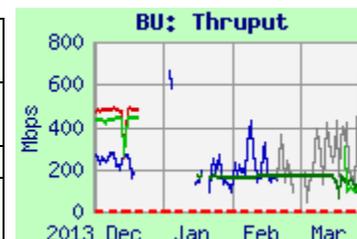
5) MA, Boston Univ:

Teams: MODIS, MISR

Domain: bu.edu

Ratings: EROS: Continued **Excellent**
LaRC: Continued **Excellent**Web Page: <http://ensight.eos.nasa.gov/Missions/terra/BU.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	345.0	176.7	87.6	StarLight / I2 / NOX
EROS PTH	700.5	268.0	50.7	StarLight / I2 / NOX
GSFC GES DISC	n/a	n/a	n/a	MAX / I2 / NOX
LaRC ASDC	179.5	104.4	80.0	NISN / MAX / I2 / NOX
LaRC PTH	171.5	165.1	100.2	NISN / MAX / I2 / NOX

**Requirements:**

Source Node	FY	mbps	Rating
EROS LPDAAC	'12 -	2.6	Excellent
LaRC ASDC DAAC	'12 -	0.7	Excellent

Comments: The old BU test node was retired in December. A temporary replacement was used beginning in January. Testing was switched to a "permanent" test node in late March.

Thruput from **EROS LPDAAC** to the temporary node was noisy, but much better than the [revised lower, was 3.0 mbps] requirements, rating "**Excellent**". The user flow from **EROS** averaged about 1.67 mbps for this period – close to the requirement without contingency. Testing from **EROS** to the permanent node was down until April, so testing was initiated from **EROS PTH**, also noisy

Testing from **LaRC ASDC DAAC** to the new node was down until late March, but thrupt greatly exceeded the requirements after that, rating "**Excellent**". Testing was added from **LaRC PTH** in the interim, performance was quite steady, but is limited to 200 mbps by agreement with CSO / NISN.

Testing from **GSFC GES DISC** to the new node is waiting on firewall rules.

6) OR, Oregon State Univ:

Ratings: LaRC ANGe: Continued **Excellent**

Teams: MISR

Domain: oce.orst.edu

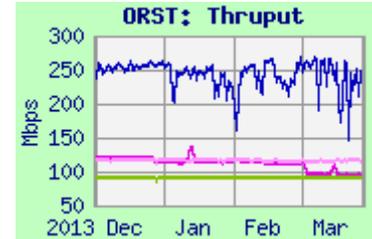
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml>

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	97.9	96.7	94.6	NISN / MAX / I2 / PNW
JPL PODAAC	274.3	245.7	176.7	CENIC / I2 / PNW
GSFC-ESDIS-PTH	118.3	116.3	112.6	MAX / I2 / PNW
GSFC-ENPL	114.1	113.0	108.2	

Requirements:

Source Node	FY	kbps	Rating
LaRC ANGe	'12 -	694	Excellent
GSFC	'02 - '11	250	Excellent



Comments: The requirements were reduced (was 7.6 mbps from LaRC) since the requirements for CERES and MODIS have been eliminated. Thruput was stable from all sources for this period, and was well above the requirements. The rating from **LaRC ANGe** remains "**Excellent**". Results from the East coast sites are limited by the longer RTT and a small window size at ORST.

7) PA: Penn State Univ:

Rating: Continued **Excellent**

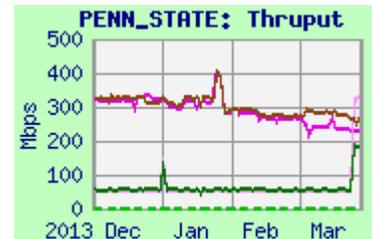
Team: MISR

Domain: psu.edu

Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml

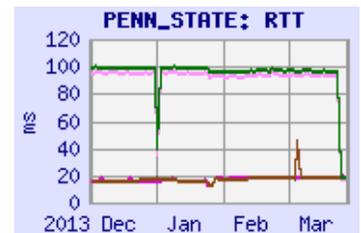
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	58.4	56.0	44.1	NISN / MAX / I2 / 3ROX
GSFC-ESDIS-PTH	56.0	54.4	47.7	MAX / I2 / 3ROX
GSFC-ENPL	272.0	268.0	232.8	
GSFC-ESTO	297.4	285.1	250.6	



Requirements:

Source Node	FY	kbps	Rating
LaRC ASDC DAAC	'03 -	556	Excellent



Comments: Thruput from NISN sources is much lower than from non-NISN sources, due to much longer RTT. Note that the forward route (to PSU) is OK (see above), but the return route to **LaRC** and **GSFC-ESDIS-PTH** is much longer -- via peering with NISN in Chicago! But due to the low [reduced from 2.6 mbps] requirement, the rating remains **Excellent**.

This return route issue was fixed in late March. The RTT from **LaRC** and **GSFC-ESDIS-PTH** dropped to similar value to the non-NISN nodes, and the performance increased correspondingly.

From **GSFC-ESTO** (on the SEN at GSFC, not EBnet) and from **GSFC-ENPL** (direct 10GigE to MAX), the RTT has always been lower (due to the optimum return route), and the thrupt is much higher than from other sources.

8) TN, Oak Ridge National Lab:

Teams: MODIS, DAAC

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ORNL.shtml>Rating: GSFC: **Excellent**

Domain: ornl.gov

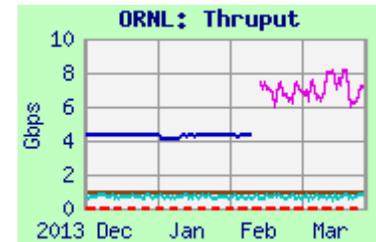
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	836.1	679.4	361.3	NISN / MAX / ESnet
GSFC-ENPL-PS	4420.9	4321.1	2436.8	MAX / ESnet
GSFC-ENPL-PTH	7793.5	6946.3	5430.1	
GSFC-ESTO	988.6	987.3	850.7	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'12 -	10.1	Excellent

Comments: Testing was added in October 2012 from **GSFC-ENPL-PS**, a 10 gig connected PerfSonar node at GSFC, to the PerfSonar node at ORNL, with excellent thruput. **The GSFC-ENPL-PS node was retired for reconfiguration in February, so testing was added from GSFC-ENPL-PTH instead, with even better results!**



Thruput stabilized from **GSFC-NISN** in December 2012. Performance was well above the requirement; the rating is therefore **Excellent**".

9) TX: Univ. of Texas - Austin:

Team: MODIS, ICESAT

Web Page: <http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml>Rating: Continued **Excellent**

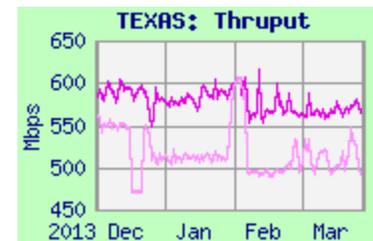
Domain: utexas.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	611.0	571.5	540.0	MAX / I2 / TX
GSFC-ESDIS-PTH	555.8	508.2	479.6	

Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 -	666	Excellent



Comments: Performance from **GSFC-ESDIS-PTH** improved in September 2012, with the EBnet firewall upgrade, and was returned in November. The thruput was well above 3 x the MODIS requirement, so the rating remains **Excellent**.

From **GSFC-ENPL-PTH**, outside most of the congested GSFC campus infrastructure, thruput is even better. This test was moved to a PerfSonar node at UT in August 2012, with greatly improved results. The results improved further in September 2012, with the switch to the 10 gig interface from **GSFC-ENPL-PTH**. In November 2013, the PerfSonar node stopped responding, so testing was switched back to the SCF.

The previous 11.1 mbps ICESAT requirement has been eliminated, and testing from ICESAT discontinued.

10) Canada, Univ of Toronto:

Rating: GSFC: Continued **Excellent**
 LaRC: Continued **Excellent**

Team: MOPITT Domain: utoronto.ca
 Web Page: <http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml>

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	341.3	174.4	52.3	NISN / StarLight / CA*net
LaRC PTH	174.2	138.4	47.0	
GSFC-ESDIS-PS	878.9	658.8	337.2	MAX / I2 / NY / CA*net

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 -	100	Excellent
GSFC EOC	'02 -	512	Excellent



Comments: Thruput from both sources are many times larger than the low requirements, so the rating remains **Excellent**.

The **LaRC ASDC DAAC** was upgraded in January, with improved performance. Thruput from **LaRC PTH** was steady, limited to 200 mbps by agreement with CSO / NISN.

11) Canada: CCRS (Ottawa)

Rating: Continued **Excellent**
 Domain: ccrs.nrcan.gc.ca

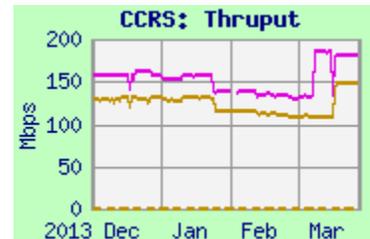
Teams: MODIS, CEOS
 Web Page: <http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml>

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	116.1	114.8	106.7	MAX / I2 / CA*net
GSFC-ENPL	154.7	138.6	131.0	

Requirement:

Source Node	FY	mbps	Rating
GSFC-MODAPS	'11 -	1.1	Excellent



The MODIS requirement was reduced from 3.8 mbps previously.

Thruput from **GSFC-MODAPS** was mostly stable, and remained much more than 3 x the requirement, so is rated **Excellent**.

Thruput from **GSFC-ENPL** was also stable, with thruput changes corresponding to RTT changes.



User flow from GSFC again averaged 2.9 mbps this period, much higher than the requirement (but consistent with the old requirement).

12) UK, Oxford Univ.:

Team: HIRDLS

Web Page: <http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml>Rating: Continued **Excellent**

Domain: ox.ac.uk

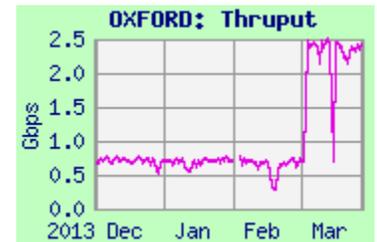
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	907.7	703.9	538.4	MAX / I2 / Géant (DC) / JAnet

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 –	368	Excellent

Comments: Beginning in late March 2012, testing was switched to a PerfSonar server at Oxford, using iperf. Testing previously had used, “flood pings”, which is a poor substitute for iperf, and provided much lower results. Performance improved again in June 2012 when the Oxford PerfSonar node was upgraded, and again in March 2014 by using a 10 gig interface from GSFC-ENPL-PTH. The thrupt is much higher than the modest requirement, so the rating continues **Excellent**.



User flow from GSFC to Oxford averaged 590 kbps for this period, higher than the requirement, and the previous period.

13) UK, London: (University College)

Teams: MODIS, MISR

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml>Rating: Continued **Excellent**

Domain: ucl.ac.uk

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	33.8	28.1	14.7	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	31.7	28.0	20.6	MAX / I2 / Géant (DC) / JAnet
EROS-PTH	18.6	16.7	10.5	StarLight / I2 / Géant (DC) / JAnet

Requirements

Source Node	FY	kbps	Rating
LaRC DAAC	'12 –	556	Excellent

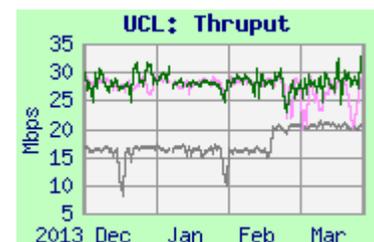
Comments: Testing since late 2010 is by nuttcp pulls, initiated at UCL.

NISN began peering with Géant in September '09, with improved thrupt from LaRC. Previously, the route from LaRC was via NISN peering with Teleglobe on the US west coast, unnecessarily increasing RTT and reducing thrupt.

Thruput from all sources was noisy but long-term stable. The median daily worst thrupt from LaRC PTH remained well above 3 x the requirement, so the rating remains **Excellent**.

From GSFC-ESDIS-PTH, performance has been stable since the EBnet firewall upgrade in September 2012.

Thruput from EROS is lower than the other sites, due to a longer RTT.



14) British Atmospheric Data CentreRating: Continued **Excellent**

(Rutherford Appleton Laboratory)

Team: HIRDLS

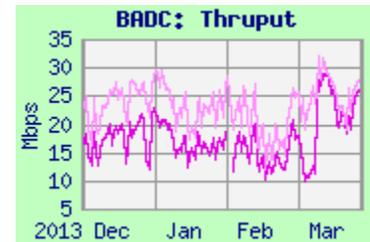
Domain: rl.ac.uk

Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ESDIS-PTH	30.8	23.3	13.8	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	21.2	17.1	10.9	

Requirements:

Source Node	FY	kbps	Rating
GSFC	'02 –	190	Excellent



Comments: Thruput from **GSFC-ESDIS-PTH** was noisy but steady, and consistently was much higher than the requirement, so the rating remains **Excellent**.

Thruput from **GSFC-ENPL-PTH** was similar to that from **GSFC-ESDIS-PTH**.

User flow averaged 130 kbps this quarter, a bit lower than last quarter, and was consistent the requirement -- without contingency.

15) New ZealandRating: **Excellent**

Team: MISR

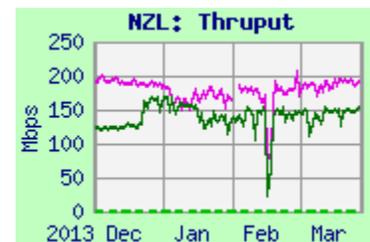
Domain: reannz.co.nz

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NZL.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	166.1	144.9	71.0	NISN / StarLight / I2 / PNW / Reannz
GSFC-ENPL-PTH	202.1	179.0	140.8	MAX / I2 / PNW / Reannz

Requirements:

Source Node	FY	kbps	Rating
GSFC	'02 –	190	Excellent



Comments: Testing to the University of Auckland was discontinued in November 2011. Testing was reinstated in October 2013, to a PerfSonar node in Auckland provided by the Reannz network. Note that the route to the University of Auckland uses Reannz – so the results are plausibly comparable.

Thruput from **LaRC PTH** consistently was much higher than the requirement, so the rating is **Excellent**.

Thruput from **GSFC-ENPL-PTH** was stable, and a little better than that from **LaRC PTH**, which is limited to 200 mbps by agreement with CSO / NISN..