EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the 4th quarter of 2013 -- 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 thruput 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:

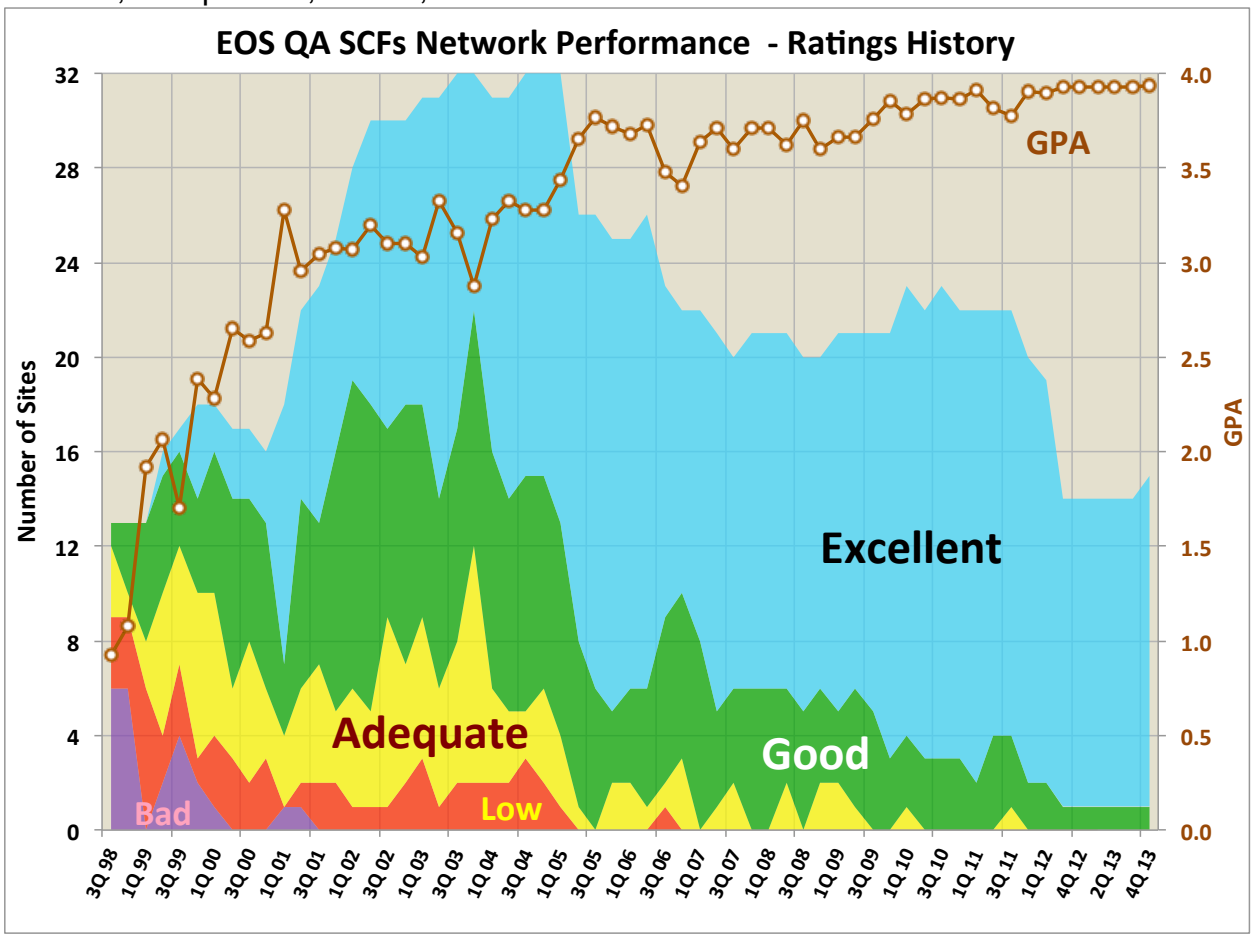
Upgrades: ↑ None

Downgrades: ↓ None

Testing added: Auckland, NZ: Excellent

Ratings History:

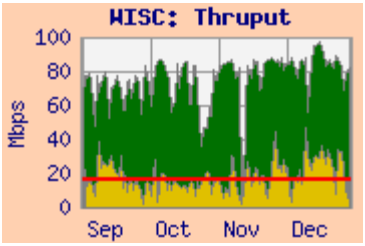
The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



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 thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.



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

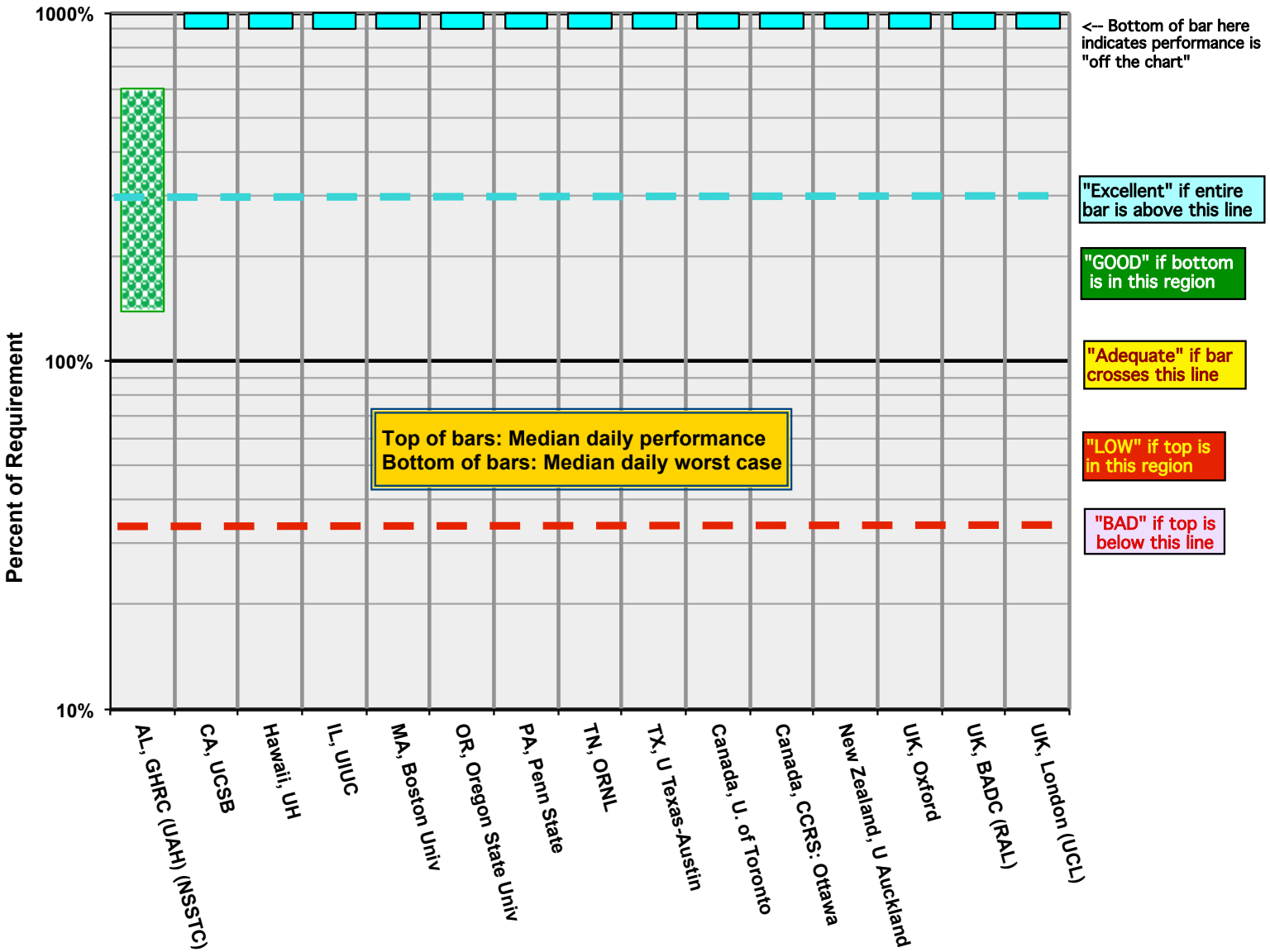
4th Quarter 2013				Testing							
Destination	Team (s)	Requirements		Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		
		Database	Nov-07						4Q 2013	3Q 2013	Route Tested
AL, GHRC (UAH) (NSSTC)	MODIS, LANCE	2.9	6.9	GSFC-MODIS	51.6	17.6	4.0	9.5	Good	Good	MAX - Internet2 - SOX - UAH
CA, UCSB	MODIS	0.17	3.1	GSFC-MODIS	156.4	154.0	140.4	1.9	Excellent	Ex	EBnet - MAX - Internet2 - CENIC
Hawaii, UH	MODIS	0.02		GSFC-ENPL	2695.4	2663.5	2197.0	2.3	Excellent	Ex	EBnet - MAX - Internet2 - LA
IL, UIUC	MISR	0.56	1.1	LaRC PTH	184.7	182.9	174.3		Excellent	Ex	NISN - MAX - Internet2 - StarLight (Chicago)
MA, Boston Univ	MODIS, MISR	2.6	3.0	GES DISC	503.7	476.1	431.3	0.01	Excellent	Ex	StarLight (Chicago) - Internet2 - NOX
OR, Oregon State Univ	CERES, MODIS, MISR	0.7	7.6	LaRC ANGe	99.5	98.0	95.9		Excellent	Ex	NISN - MAX - Internet2 - PNW
PA, Penn State	MISR	0.6	2.6	LaRC PTH	57.7	56.1	47.5		Excellent	Ex	NISN - MAX - 3ROX
TN, ORNL	MODIS	10.1		GSFC-ENPL	4446.6	4324.1	3145.5		Excellent	Ex	MAX - ESnet
TX, U Texas-Austin	MODIS	0.7	11.1	GSFC-ESDIS-PTH	580.3	548.4	526.5	0.4	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	59.3	55.9	42.5		Excellent	Ex	NISN - StarLight (Chicago) - CA*net
Canada, CCRS: Ottawa	CEOS, MODIS	1.1	3.8	GSFC-MODIS	130.9	129.6	113.5	3.0	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	168.5	123.9	104.5		Excellent	n/a	NISN - StarLight (Chicago) - I2 - Reannz
UK, Oxford	HIRDLS	0.4	0.5	GSFC-ENPL-PTH	912.9	720.5	518.3	0.2	Excellent	Ex	MAX - Géant (DC) - JAnet
UK, BADC (RAL)	HIRDLS	0.2	0.2	GSFC-ESDIS-PTH	30.4	23.8	14.0	0.2	Excellent	Ex	EBnet - MAX - Géant (DC) - JAnet
UK, London (UCL)	MISR, MODIS	0.6	1.0	LaRC PTH	36.2	31.0	11.7		Excellent	Ex	NISN - MAX - Géant (DC) - JAnet

*Rating Criteria:	
Excellent	Median Daily Worst >= 3 * **Requirement**
Good	Median Daily Worst >= **Requirement**
Adequate	Median Daily Worst < **Requirement** <= Median Daily Median
LOW	Median Daily Median < **Requirement**
BAD	Median Daily Median < **Requirement** / 3

Summary		
Rating	Current: 4Q 2013	Prev Report
Excellent	14	13
Good	1	1
Adequate	0	0
LOW	0	0
BAD	0	0
Total	15	14
GPA	3.93	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.

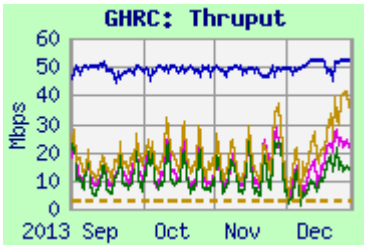
1) AL, GHRC (UAH) (aka NSSTC)

Rating: Continued **Good**

Teams: AMSR, MODIS, LANCE
Domain: nsstc.uah.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml

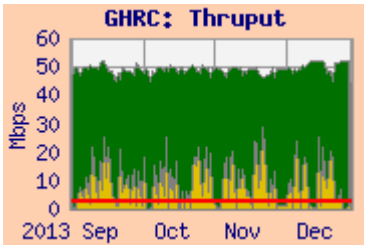
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
MODAPS-PDR	51.6	17.6	4.0	MAX / I2 / SOX
GSFC-EDOS	30.5	12.5	3.2	
GSFC-EDOS	52.2	49.3	34.6	NISN / MSFC
LaRC-PTH	30.2	10.1	2.3	NISN / MAX / I2 / SOX



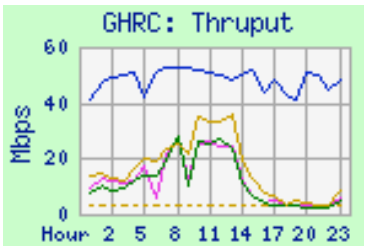
Requirements:

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, retuned in June, and is used as the basis for the rating.

Thruput to the UAH address from the 3 sources to was mostly similar, with significant improvement late at night and on weekends. The "hourly" graph is for a typical week in mid-November, and shows considerable time-of-day variation via the UAH route.



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**.

User flow is now 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 9.5 mbps – over 3 x the requirement (again)!**

Notes:

- 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**

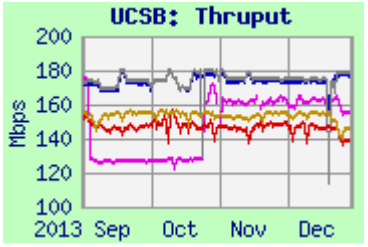
Teams: MODIS

Domain: ucsb.edu

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

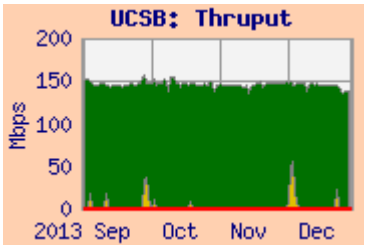
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	156.4	154.0	140.4	MAX / I2 / CENIC
GSFC-GES DISC	153.6	146.9	135.1	
GSFC-ENPL	164.9	160.9	146.6	
EROS-LPDAAC	174.0	173.5	164.8	StarLight / I2 / CENIC
EROS-PTH	175.5	174.9	161.6	



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 1.94 mbps this period, about half of last quarter, well above the new requirement (but close to the old requirement without contingency). The user flow from **EROS-LPDAAC** averaged 0.56 mbps this period, well below the old requirement. Performance from **GSFC-ENPL** dropped a bit in September, but recovered in October. Also note the expanded scale on the graph.

---

3) HI, University of Hawaii:

Ratings: GSFC: Continued **Excellent**

Team: MODIS

Domain: uhnet.net

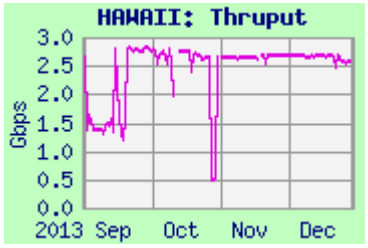
Web Page: http://ensight.eos.nasa.gov/Missions/terra/HAWAII.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	2695.4	2663.5	2197.0	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 thruput is much more than the tiny requirement, so the rating remains **Excellent**

4) IL, UIUC:

Rating: LaRC: **Excellent**

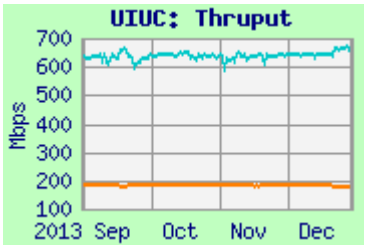
Teams: MISR

Domain: uiuc.edu

Web page: http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	184.7	182.9	174.3	NISN / StarLight / I2
GSFC-NISN	667.2	640.8	184.5	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 thruput 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 thruput. The SCP tests were discontinued in May 2012. The thruput 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:

Ratings: EROS: Continued **Excellent**

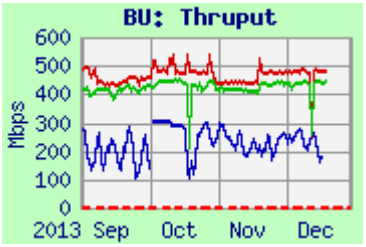
LaRC: Continued **Excellent**

Teams: MODIS, MISR Domain: bu.edu

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

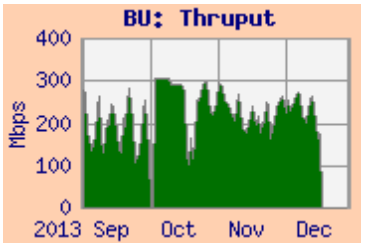
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	281.8	242.8	153.3	StarLight / I2 / NOX
GSFC GES DISC	503.7	476.1	431.3	MAX / I2 / NOX
LaRC ASDC	448.3	433.2	365.4	NISN / MAX / I2 / NOX



Requirements:

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



Comments: BU is well connected. Thruput from **EROS LPDAAC** was noisy, but much better than the [revised lower, was 3.0 mbps] requirements, rating "**Excellent**". The user flow from **EROS** (shown on the integrated graph), averaged about 0.08 mbps for this period – well below the requirement without contingency.

Thruput from **GSFC GES DISC** was stable and much higher than the requirement. User flow from GSFC was only about 0.01 mbps.

Thruput from **LaRC ASDC DAAC** was less noisy than previously, and greatly exceeded the requirements.

6) OR, Oregon State Univ:

Ratings: LaRC ANGe: Continued **Excellent**

Teams: MISR

Domain: oce.orst.edu

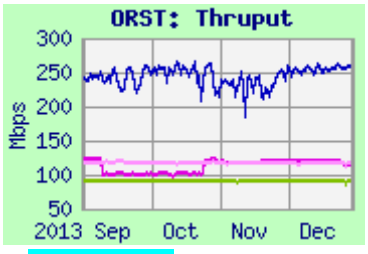
Web Page:http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	99.5	98.0	95.9	NISN / MAX / I2 / PNW
JPL PODAAC	272.2	249.2	188.0	CENIC / I2 / PNW
GSFC-ESDIS-PTH	119.3	117.5	113.5	MAX / I2 / PNW
GSFC-ENPL	120.5	119.2	110.3	

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**

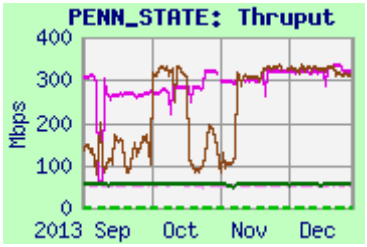
Team: MISR

Domain: psu.edu

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

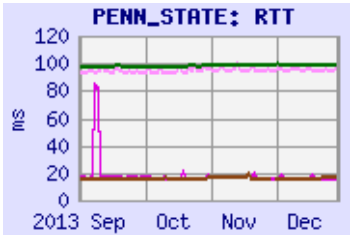
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	57.7	56.1	47.5	NISN / MAX / I2 / 3ROX
GSFC-ESDIS-PTH	55.0	53.7	47.4	MAX / I2 / 3ROX
GSFC-ENPL	321.6	314.4	260.7	
GSFC-ESTO	331.3	313.6	245.8	



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**.

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

8) TN, Oak Ridge National Lab:

Rating: GSFC: **Excellent**

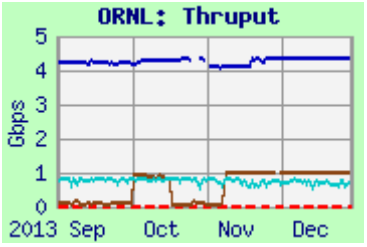
Teams: MODIS, DAAC
Domain: ornl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ORNL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	840.5	770.2	384.0	NISN / MAX / ESnet
GSFC-ENPL-PS	4446.6	4324.1	3145.5	MAX / ESnet
GSFC-ESTO	988.2	987.2	857.9	MAX / ESnet

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 (which improved in March 2013 due to an ESnet upgrade).

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:

Rating: Continued **Excellent**

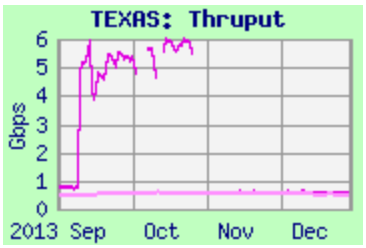
Team: MODIS, ICESAT
Domain: utexas.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	643.1	594.0	564.0	MAX / I2 / TX
GSFC-ESDIS-PTH	580.3	548.4	526.5	

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 retuned 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, with the switch to the 10 gig interface from **GSFC-ENPL-PTH**. In November the PerfSonar node stopped responding, so testing was switched back to the SCF, with the latter results dominating the values above. [The test from GSFC-ESDIS-PTH remained 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**

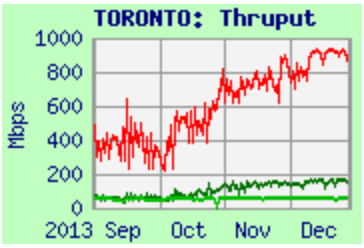
Team: MOPITT Domain: utoronto.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	59.3	55.9	42.5	NISN / StarLight / CA*net
LaRC PTH	173.9	131.6	37.4	
GSFC-ESDIS-PS	926.1	723.6	299.8	MAX / I2 / NY / CA*net

Requirements:

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



Comments: Performance from all sources dropped in August and September (but recovered in October), indicating congestion near Toronto. However, the ratings from both sources remain **Excellent**, due in part to the low requirements.

Thruput from **LaRC ASDC DAAC** dropped in late April '12 due to congestion at ASDC. Other destinations dropped similarly from **LaRC ASDC** at the same time; however, no such drop was observed from **LaRC PTH**, indicating that the problem was not a WAN problem but was local to **LaRC ASDC**.

---

11) Canada: CCRS (Ottawa)

Rating: Continued **Excellent**

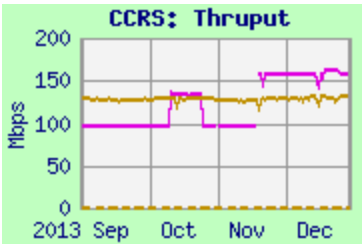
Teams: MODIS, CEOS Domain: ccrs.nrcan.gc.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml

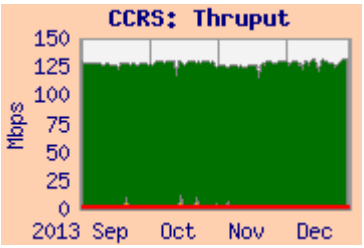
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	130.9	129.6	113.5	MAX / I2 / CA*net
GSFC-ENPL	136.8	134.5	128.3	

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 stable, and remained much more than 3 x the requirement, so is rated **Excellent**.

Thruput from **GSFC-ENPL** improved in November, with retuning.

User flow from GSFC again averaged 3.0 mbps this period, much higher than the requirement (but consistent with the old requirement).

12) UK, Oxford Univ.:

Rating: Continued **Excellent**

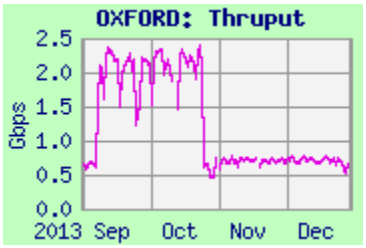
Team: HIRDLS
Domain: ox.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	912.9	720.5	518.3	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 April 2013 by using a 10 gig interface from **GSFC-ENPL-PTH**. Further configuration changes of **GSFC-ENPL-PTH** and the server at Oxford are responsible for subsequent performance changes. The thruput is much higher than the modest requirement, so the rating continues **Excellent**.

Testing from **GSFC-ENPL-PS** was steady, until it stopped working in July.

User flow from GSFC to Oxford averaged 170 kbps for this period, consistent with the requirement, but well below the previous period.

---

13) UK, London: (University College)

Rating: Continued **Excellent**

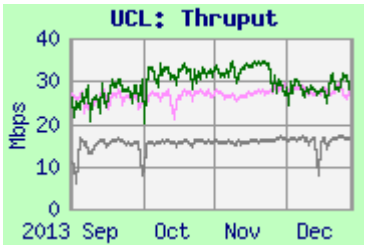
Teams: MODIS, MISR
Domain: ucl.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	36.2	31.0	11.7	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	29.8	27.1	20.6	MAX / I2 / Géant (DC) / JAnet
EROS-PTH	17.4	15.8	10.2	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 thruput from **LaRC.** Previously, the route from LaRC was via NISN peering with Teleglobe on the US west coast, unnecessarily increasing RTT and reducing thruput.

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

From GSFC-ESDIS, 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 Centre

Rating: Continued **Excellent**

(Rutherford Appleton Laboratory) Team: HIRDLS Domain: rl.ac.uk

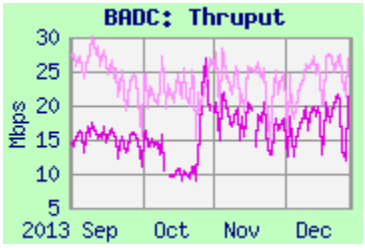
Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ESDIS-PTH	30.4	23.8	14.0	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	21.1	16.5	10.7	

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 beginning in October.

User flow averaged 220 kbps this quarter, a bit higher than last quarter, and the requirement -- with contingency.

---

15) New Zealand

Rating: **Excellent**

Team: MISR Domain: reannz.co.nz

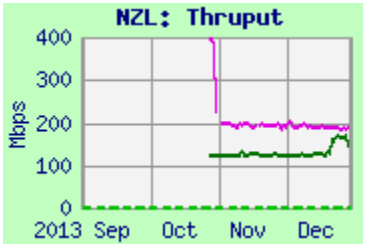
Web Page: http://ensight.eos.nasa.gov/Missions/terra/NZL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	168.5	123.9	104.5	NISN / StarLight / I2 / PNW / Reannz
GSFC-ENPL-PTH	217.1	191.2	175.0	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 better than that from **LaRC PTH**.