

EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the 2nd quarter of 2011 -- comparing the performance against the requirements, including Terra, TRMM, QuikScat, Aqua, Aura, ICESat, and GEOS requirements

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:

- Mostly stable performance.
 - **ALL Nodes rated at least Good (mostly Excellent!)**
 - **GPA 3.82** (was 3.91 last quarter)
 - Performance to nodes at Universities is lower (and experiences diurnal variation) when classes are in session
 - Diurnal variation not seen much in Q2.
 - EROS upgraded the tail circuit to Chicago from OC-12 (622 mbps) to OC-48 (2.5 gbps) in March
- Requirements: the Nov '07 requirements are used as the basis for the ratings
 - Requirements update is [still] in progress
 - Requirements added for CCRS (Ottawa, Canada) and University of Auckland, NZ.
 - NPP requirement added to Wisconsin → downgrade to **Good**

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

Low: median of daily medians < requirement.

Bad: median of daily medians < 1/3 of the requirement.

Ratings Changes:

New:

CCRS: **Excellent**

Auckland, NZ: **Excellent**

Downgrade: ↓

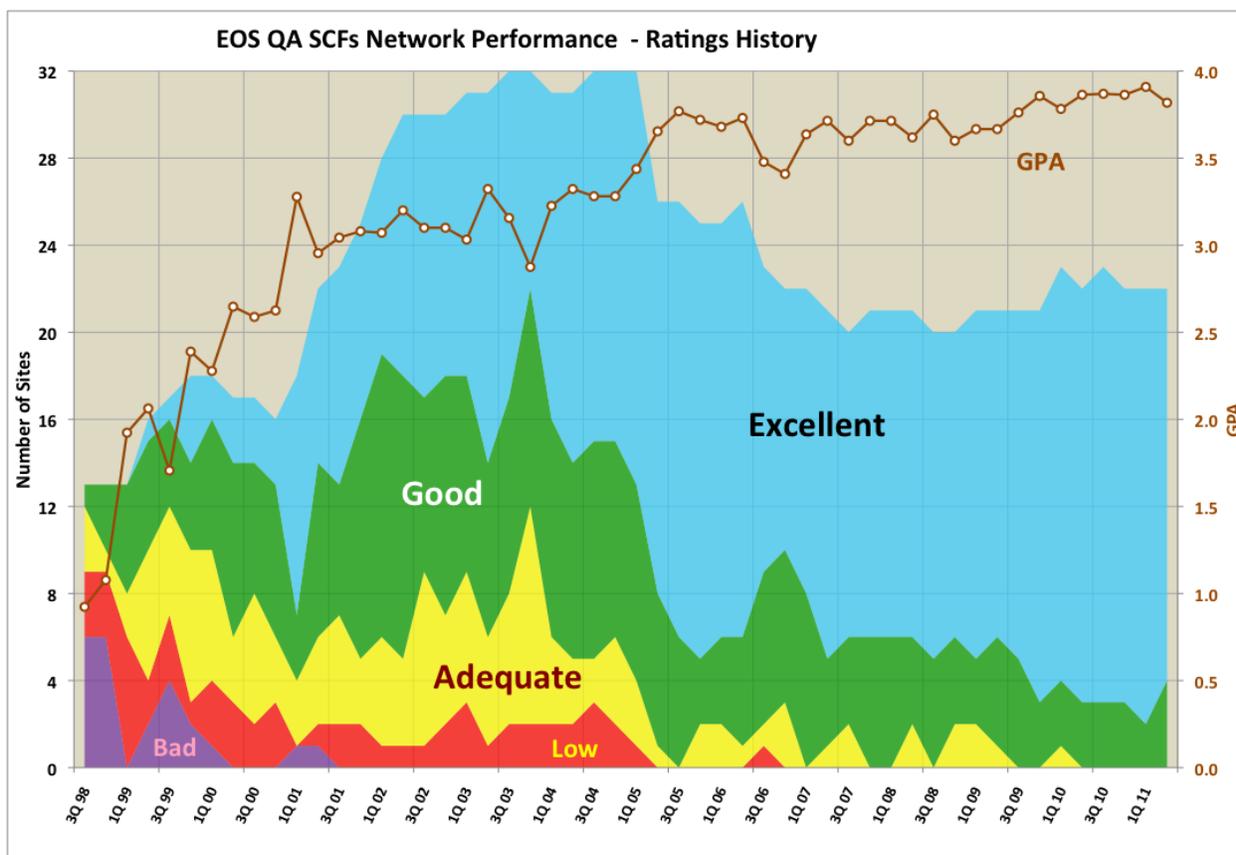
Texas: **Excellent** → **Good**

Wisconsin: **Excellent** → **Good**

Discontinued: LANL, PNNL

Ratings History:

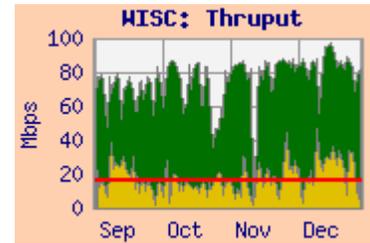
The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



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.
- 2Q06: Testing discontinued to SAGE III Nodes
- 3Q06: Testing discontinued to NOAA and UMD
- 4Q06: Testing discontinued to UIUC
- 2Q07: Testing discontinued to U Washington
- 1Q09: Testing added to BADC (RAL).
- 1Q10: Testing to Oxford restored.
- 1Q10: ICESAT functions of Ohio State were transferred to Buffalo. Testing to Buffalo added.
- 2Q10: 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

Integrated Charts: Integrated charts are now 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, 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.



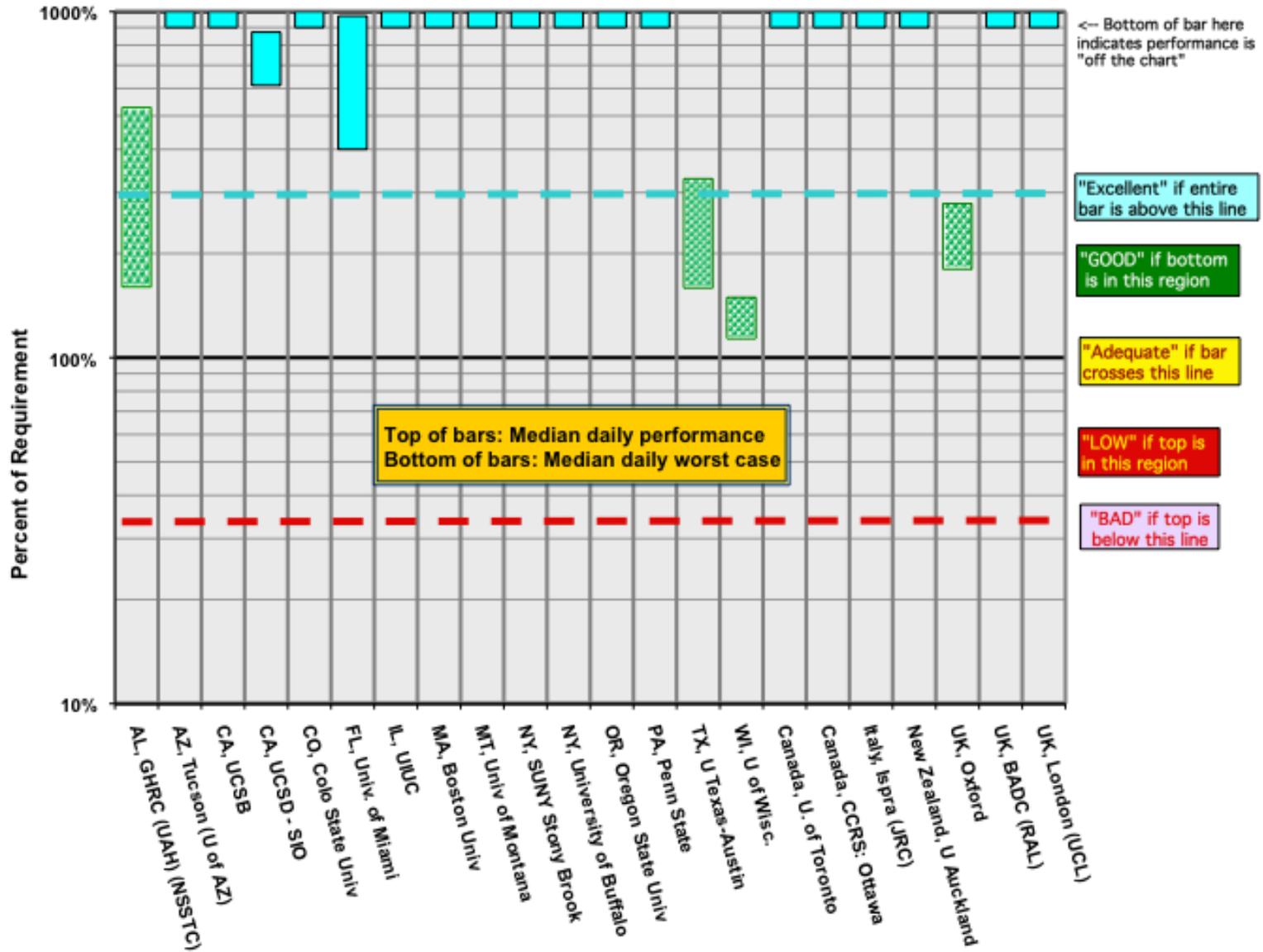
Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs.

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

2nd Quarter 2011		Testing									
Destination	Team (s)	Requirement	Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		Route Tested	
		Nov-07						2 Q 2011	1Q11		
AL, GHRC (UAH) (NSSTC)	CERES, ASTER, LIS	6.9	LaRC PTH	45.5	36.7	11.1		Good	Good	NISN / MAX / Internet2 / SOX / UAH	
AZ, Tucson (U of AZ)	MODIS	2.6	EROS LPDAAC	62.5	51.9	32.4	3.0	Excellent	Ex	StarLight (Chicago) / Internet2 / CENIC	
CA, UCSB	MODIS	3.1	GSFC-MODIS	92.4	80.5	44.6	0.4	Excellent	Ex	MAX / Internet2 / CENIC	
CA, UCSD - SIO	ICESAT, CERES	7.1	GSFC-ICESAT	74.4	62.0	43.5		Excellent	Ex	NISN / MAX / Internet2 / CENIC	
CO, Colo State Univ	CERES	2.1	LaTIS	161.1	158.4	137.6		Excellent	Ex	NISN / MAX / Internet2 / FRGP	
FL, Univ. of Miami	MODIS, MISR	18.8	GSFC-NISN-PTH	194.1	182.9	75.3	0.16	Excellent	Ex	MAX / Internet2 / SOX	
IL, UIUC	MISR	1.1	LaRC PTH	111.6	109.1	36.9		Excellent	Ex	Internet2 via NISN / MAX	
MA, Boston Univ	MODIS, MISR	3.0	EROS LPDAAC	230.2	189.9	112.1	3.1	Excellent	Ex	StarLight (Chicago) / Internet2 / NOX	
MT, Univ of Montana	MODIS	0.8	EROS LPDAAC	83.4	72.5	50.0	5.1	Excellent	Ex	StarLight (Chicago) / Internet2 / PNW	
NY, SUNY Stony Brook	CERES	0.6	LaTIS	51.1	36.0	22.2		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet	
NY, University of Buffalo	ICESAT	6.3	GSFC-ICESAT	88.2	83.1	67.8		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet	
OR, Oregon State Univ	CERES, MODIS	7.6	LaTIS	115.0	114.7	114.5		Excellent	Ex	NISN / MAX / Internet2 / PNW	
PA, Penn State	MISR	2.6	LaRC DAAC	222.8	191.1	135.8		Excellent	Ex	NISN / MAX / 3ROX	
TX, U Texas-Austin	ICESAT	11.1	GSFC-ICESAT	96.2	36.4	17.6	0.49	Good	Ex	NISN / MAX / Internet2 / TX-learn	
WI, U of Wisc.	MODIS, CERES, AIRS, NPP	124.0	NPP SD3E	207.0	185.2	140.7	73.9	Good	Ex	MAX / Internet2 / MREN	
Canada, U. of Toronto	MOPITT	0.6	LaRC DAAC	58.3	57.8	44.2		Excellent	Ex	NISN / StarLight (Chicago) / CA*net4	
Canada, CCRS: Ottawa	CEOS, MODIS	3.8	GSFC-MODIS	80.5	77.3	71.7		Excellent	n/a	MAX / Internet2 / CA*net4	
Italy, Ispra (JRC)	MISR	0.5	LaRC DAAC	23.6	19.2	16.4		Excellent	Ex	NISN / MAX / Géant (DC) / GARR	
New Zealand, U Auckland	MISR	0.3	LaRC PTH	18.0	16.2	4.4		Excellent	n/a	NISN / StarLight (Chicago) / PNW / PacWave	
UK, Oxford	HIRDLS	0.5	GSFC-ENPL-PTH	1.94	1.43	0.92	0.63	Good	Good	Internet2 / Géant (DC) / JANet	
UK, BADC (RAL)	HIRDLS	0.2	GSFC-ESDIS-PTH	14.3	9.7	7.3		Excellent	Ex	Internet2 / Géant (DC) / JANet	
UK, London (UCL)	MISR, MODIS	1.0	LaRC PTH	33.0	30.9	14.4		Excellent	Ex	NISN / MAX / Géant (DC) / JANet	
		Revised					Summary				
		*Rating Criteria:							Current:	Prev	
								Rating	2 Q 2011	Report	
Excellent	Median Daily Worst >= 3 * Requirement						Excellent	18	20		
Good	Median Daily Worst >= Requirement						Good	4	2		
Adequate	Median Daily Worst < Requirement <= Median Daily Median						Adequate	0	0		
LOW	Median Daily Median < Requirement						LOW	0	0		
BAD	Median Daily Median < Requirement / 3						BAD	0	0		
								Total	22	22	
								GPA	3.82	3.91	

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. The first test listed is the one on which the rating is based -- it is from the source most relevant to the driving requirement. 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: CERES, AMSR

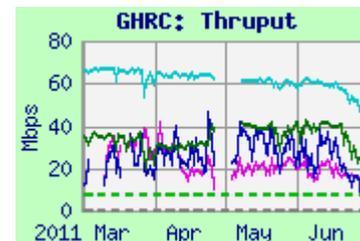
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml>

Rating: Continued **Good**

Domain: nsstc.uah.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	45.5	36.7	11.1	NISN / MAX / I2 / SOX
GSFC-CNE	64.8	61.0	29.9	
GSFC-EDOS	50.0	27.0	4.8	MAX / I2 / SOX



Requirements:

Source Node	FY	Mbps	Rating
LaRC ANGe	'06 – '09	7.0	Good

Comments: Testing uses nuttcp to new test node since October '10 with improved performance. Median daily worst thruput from LaRC-PTH remains below 3x the requirement, so the rating remains **Good**.

Testing was initiated in December from GSFC-EDOS for LANCE flows; an additional LANCE test was initiated in March with similar results.

Note: Testing between GHRC, RSS and NSIDC for AMSR-E (AQUA) is included in the "Production Sites" report.

2) AZ, Tucson (U of AZ):

Team: MODIS

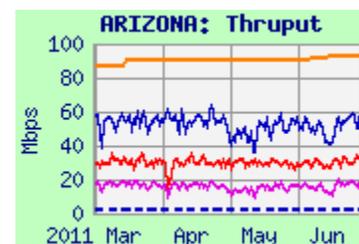
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml>

Rating: Continued **Excellent**

Domain: arizona.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	62.5	51.9	32.4	StarLight / I2 / CENIC
EROS SCP	19.9	15.6	7.1	
EROS PTH SCP	40.8	29.6	5.9	
GSFC ENPL	90.7	90.6	90.0	MAX / I2 / CENIC



Requirements:

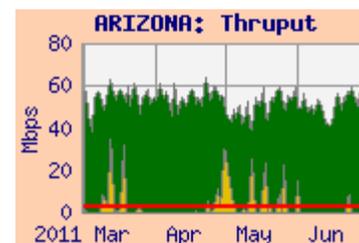
Source Node	FY	Mbps	Rating
EROS LPDAAC	'03 - '09	2.6	Excellent

Comments: Thruput from EROS LPDAAC stabilized and improved in January. The median daily worst was way above 3 x the requirement, so the rating remains "**Excellent**".

SCP testing from EROS LPDAAC is only about half of that seen from EROS PTH.

From GSFC-ENPL, thruput is even better and very stable.

The average user flow from EROS was about 2.8 mbps, consistent with the requirement.



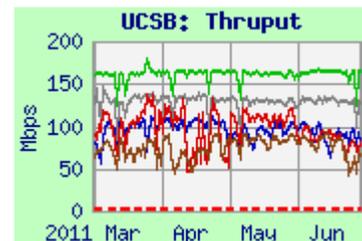
3) CA, UCSB :

Teams: MODIS
 Domain: ucsb.edu
 Web page: <http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml>

Ratings: GSFC: Continued **Excellent**
 EROS: Continued **Excellent**

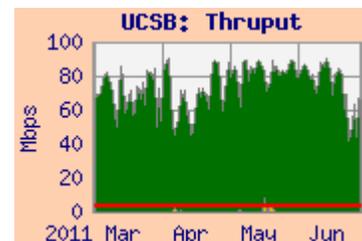
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	92.4	80.5	44.6	MAX / I2 / CENIC
GSFC-GES DISC	127.9	97.7	51.5	
GSFC-ENPL	165.7	163.6	134.3	
EROS-LPDAAC	107.6	96.5	56.8	StarLight / I2 / CENIC
EROS-PTH	143.4	130.5	90.5	



Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 - '09	3.1	Excellent
EROS-LPDAAC	'04 - '09	2.2	Excellent



Comments: The requirements are split between EROS and GSFC. **Thruput from all sites is pretty stable.** The rating remains “**Excellent**” from both EROS and **GSFC-MODIS**. The user flow from GSFC averaged only 0.33 mbps this period, well below typical and the requirement.

4) CA, UCSD (SIO):

Teams: CERES, ICESAT
 Domain: ucsd.edu
 Web Page: <http://ensight.eos.nasa.gov/Missions/terra/UCSD.shtml>

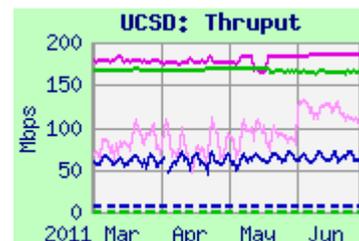
Ratings: ICESAT: Continued **Excellent**
 ANGe: Continued **Excellent**

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	74.4	62.0	43.5	NISN SIP / MAX / I2 / CENIC
LaRC ANGe (LaTIS)	168.1	166.9	161.5	
GSFC-ESDIS-PTH	118.7	94.9	64.4	MAX / I2 / CENIC
GSFC-ENPL	183.7	183.4	173.4	

Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'05 – '09	7.0	Excellent
LaRC ANGe	'02 - '09	0.26	Excellent



Comments: Performance from all sources was quite stable. The daily minimum thruput from ICESAT is above 3 x the requirement, so the rating remains “**Excellent**”

Performance from **GSFC-ENPL** is better and very steady. Testing from **GSFC-ESDIS-PTH** was returned in late May (TSO was disabled, reducing packet loss due to bursts), with improved results. There was no measurable user flow from ICESAT during this period.

Performance from **ANGe (LaTIS)** was very stable. The **ANGe** rating continues as “**Excellent**”.

5) CO, Colo State Univ.:

Teams: CERES, ICESAT

Web page: http://ensight.eos.nasa.gov/Missions/terra/COLO_ST.shtmlRating: Continued **Excellent**

Domain: colostate.edu

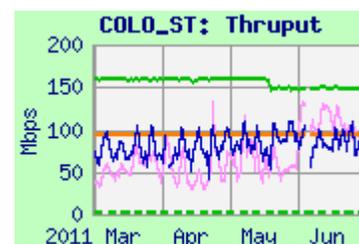
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	161.1	158.4	137.6	NISN SIP / MAX / I2 / FRGP
GSFC-ICESAT	118.9	81.6	41.1	
GSFC-ESDIS-PTH	126.9	68.7	39.5	MAX / I2 / FRGP
GSFC-ENPL	93.1	93.0	92.9	

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe (LaTIS)	'04 - '09	2.15	Excellent

Comments: Thruput from all sources was less noisy, with smaller best:worst ratios. Performance from LaRC ANGe remained well above 3 x the requirement, so the rating remains "**Excellent**". Testing from GSFC-ENPL is very stable, outside most GSFC campus firewalls, limited by its 100 mbps ethernet connection. Testing from GSFC-ESDIS-PTH improved in late May, when TSO was disabled, reducing packet loss due to bursts.

**6) FL, Univ. of Miami:**

Teams: MODIS, MISR

Domain: rsmas.miami.edu

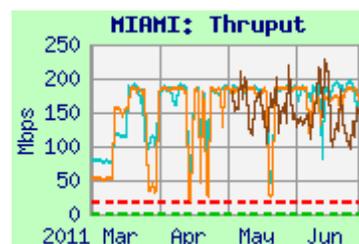
Web page: <http://ensight.eos.nasa.gov/Missions/terra/MIAMI.shtml>Rating: GSFC: Continued **Excellent**LaRC: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	194.1	182.9	75.3	MAX / I2 / SOX
GSFC-MODIS	238.7	146.3	66.0	
LaRC PTH	185.8	183.5	61.5	NISN / MAX / I2 / SOX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 - '09	18.8	Excellent
LaRC	'04 - '09	1.1	Excellent

Comments: In March thruput improved from all sources, but became bimodal (mostly stabilized at the higher level in late April). Thruput from GSFC-NISN was steady, and well above the requirement. The average daily worst was above 3x the requirement, so the rating remains "**Excellent**".



Iperf testing from GSFC-MODIS resumed in May. Results were similar to GSFC-NISN.

Thruput was also steady after March from LaRC PTH. The rating from LaRC remains "**Excellent**".

7) IL, UIUC:

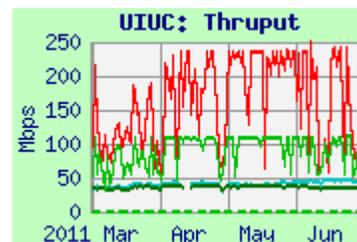
Teams: MISR

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-SCP	111.6	109.1	36.9	NISN / StarLight / I2
LaRC PTH	40.5	37.1	33.2	
GSFC-NISN-SCP	250.0	207.8	46.0	MAX / I2
GSFC-NISN	49.7	42.0	34.4	

**Requirements:**

Source Node	FY	mbps	Rating
LaRC ASDC	'04 -	1.1	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 is noisy from both sources, somewhat bimodal, but well above the requirement; so the rating remains **Excellent**.

In October '10, nuttcp testing was added, initiated by UIUC, receiving from GSFC and LaRC. Thrupt on these tests is steadier than SCP, but much lower, apparently due to significant incoming packet loss (which is causing the noisiness on the SCPs as well).

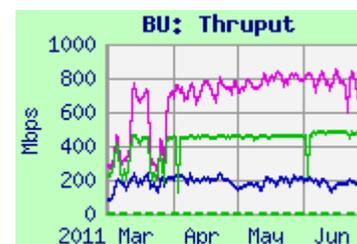
8) MA, Boston Univ:

Teams: MODIS, MISR

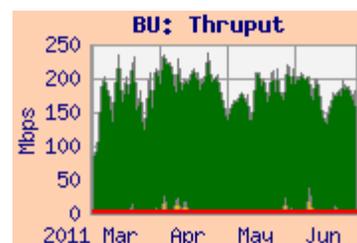
Domain: bu.edu

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	230.2	189.9	112.1	StarLight / I2 / NOX
GSFC ENPL	863.7	767.4	511.0	MAX / I2 / NOX
LaRC ASDC	457.8	455.2	335.1	NISN / MAX / I2 / NOX

**Requirements:**

Source Node	FY	mbps	Rating
EROS LPDAAC	'04 - '09	3.0	Excellent
LaRC ASDC DAAC	'04 - '09	1.2	Excellent



Comments: BU is well connected, with peaks close to 1 gbps. When students are present, there is a major diurnal variation in thrupt from all sources(e.g., March, but not April-June).

Thrupt from all sources was much better than the requirements, rating "**Excellent**". From EROS LPDAAC, the user flow (shown on the integrated graph) averaged about 3.1 mbps for this period -- very close to the requirement). Thrupt from GSFC and LaRC ASDC DAAC also greatly exceeded the requirements. User flow from GSFC averaged of 2.6 mbps.

9) MT, Univ of Montana:

Teams: MODIS

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

Domain: ntsg.umt.edu

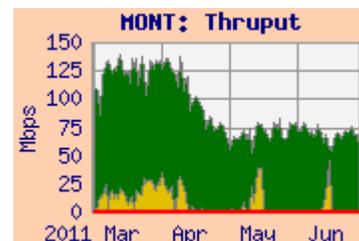
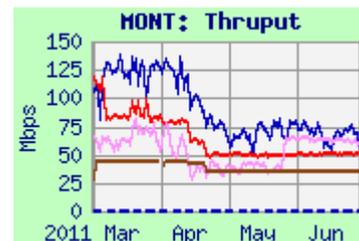
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	83.4	72.5	50.0	StarLight / I2 / PNW
EROS PTH	55.7	50.4	44.9	
GSFC-ESDIS	64.5	51.2	34.7	MAX / I2 / PNW
NSIDC	35.0	34.9	34.2	CU / FRGP / I2 / PNW

Requirement:

Source Node	FY	mbps	Rating
EROS LPDAAC	'04 - '09	0.82	Excellent

Comments: Performance from all sources dropped but stabilized in April. With the very low requirement, the rating remains "**Excellent**". The average user flow from EROS was 5.1 mbps for the 3 month period – well above the requirement.

**10) NY, SUNY-SB:**

Teams: CERES, MODIS

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

Domain: sunysb.edu

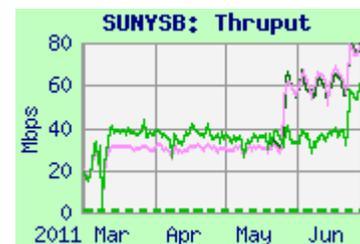
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	51.1	36.0	22.2	NISN / MAX / I2 / NYSERnet
GSFC-ESDIS	36.6	31.2	25.4	MAX / I2 / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe	'02-'09	0.57	Excellent

Comments: Thruput from ESDIS improved in late May with TSO being disabled, and from both sources in late June with retuning. Performance from both sources exhibits a significant diurnal component when classes are in session (e.g., March). The daily worst for this period more than 3 x the requirement from both sources, so the rating remains "**Excellent**".

**11) NY, University of Buffalo:**

Team: ICESAT

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

Domain: buffalo.edu

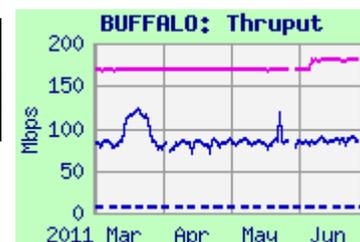
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	88.2	83.1	67.8	NISN / MAX / I2 / NYSERnet
GSFC-ENPL	169.2	169.0	167.1	MAX / I2 / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'09 -	6.3	Excellent

Comments: This node replaced Ohio-State for ICESAT, and assumes its requirement. The thruput is very stable, well above 3 x the requirement from both sources, so the rating remains "**Excellent**".



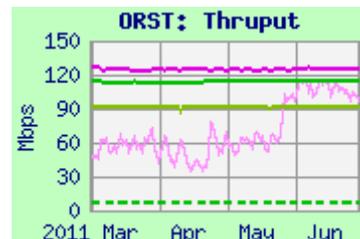
12) OR, Oregon State Univ: Ratings: LaRC ANGe: Continued **Excellent**
 Teams: CERES, MODIS Domain: oce.orst.edu GSFC: Continued **Excellent**
 Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml>

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	115.0	114.7	114.5	NISN / MAX / I2 / PNW
JPL-PTH	91.2	91.0	90.6	CENIC / I2 / PNW
GSFC-ESDIS-PTH	77.8	63.8	46.9	MAX / I2 / PNW
GSFC-ENPL	126.0	124.7	123.1	

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe	'04 - '09	7.5	Excellent
GES DISC	'02 - '09	0.25	Excellent



Comments: Performance from all sources was very stable for this period, and thruput was well above the requirement. The ratings from both LaTIS and GSFC remain "**Excellent**".

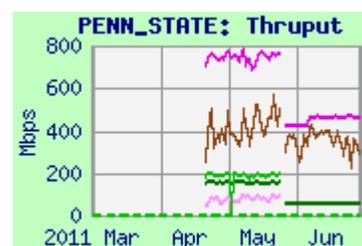
Thruput from **GSFC-ESDIS-PTH** improved in late May when TSO was disabled, reducing packet loss. Testing from **GSFC-ENPL** is not subject to congestion at GSFC – its median and worst performance is higher.

Thruput from **JPL-PTH** is also very stable.

13) 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 ASDC DAAC	222.8	191.1	135.8	NISN / MAX / I2 / 3ROX
LaRC-PTH	108.1	102.9	64.7	
GSFC-ESDIS-PTH	58.1	56.6	47.9	MAX / I2 / 3ROX
GSFC-ENPL	629.8	574.9	458.4	
GSFC-ESTO	443.2	377.1	255.8	

**Requirements:**

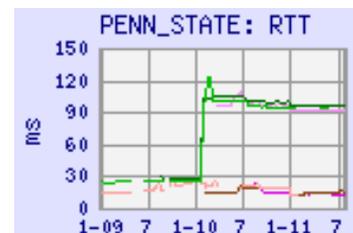
Source Node	FY	mbps	Rating
LaRC DAAC	'03-'09	2.6	Excellent

Comments: Thruput from all sources dropped in mid May (unknown cause).

Note that the forward route is OK (see above), but the return route to LaRC and **GSFC-ESDIS-PTH** is much longer -- now via peering with NISN in Chicago! But due to the low requirement, the rating remains "**Excellent**".

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

Testing stopped in mid January, when the old test host was retired (testing resumed to the new test host in mid April)



14) TX: Univ. of Texas - Austin:Rating:  **Excellent** → **Good**
Domain: utexas.edu

Team: ICESAT

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-ICESAT	96.2	36.4	17.6	NISN / MAX / I2 / TX
GSFC-ENPL-PTH	112.2	103.5	95.3	MAX / I2 / TX
GSFC-ESDIS-PTH	77.8	46.6	26.8	

Requirements:

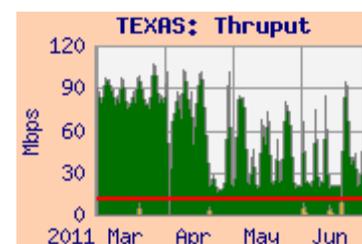
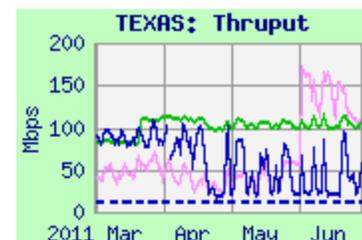
Source Node	FY	mbps	Rating
GSFC-ICESAT	05-'09	11.1	Good

Comments: Thruput from ICESAT became noisier and the average declined in April. The daily minimum thruput from ICESAT remains above the requirement, but now by less than 3 x, so the rating drops "**Good**".

Thruput from GSFC-ESDIS-PTH improved in late May, when TSO was disabled, reducing packet loss.

From GSFC-ENPL, outside most of the congested GSFC campus infrastructure, thruput is much less noisy – and higher.

The average user flow this period was only 490 kbps, only about 4.4% of the requirement, very similar to last quarter.

**15) WI, Univ. of Wisconsin:**Ratings: GSFC NPP:  **Excellent** → **Good**
LARC: Continued **Excellent**

Teams: MODIS, CERES, AIRS, NPP

Domain: ssec.wisc.edu

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

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DISC	304.8	246.7	165.1	MAX / I2 / MREN
NPP-SD3E	207.0	185.2	140.7	
Mini IDPS	352.1	281.5	163.8	NISN / MAX / I2 / MREN
LaRC ANGe	122.8	122.6	117.4	
GSFC-ENPL	302.4	291.0	245.6	MAX / I2 / MREN

Requirements:

Source Node	FY	mbps	Rating
GSFC DISC	'04 - '09	16.5	Excellent
NPP-SD3E	'11 -	124	Good
LaRC Combined	'05 - '09	7.9	Excellent

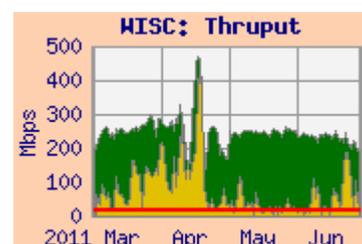
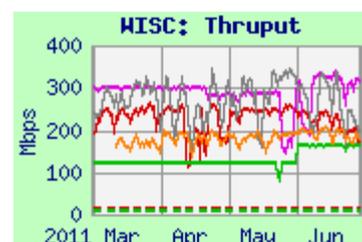
Comments: Performance from all sources was mostly stable this period.

The NPP requirement for flow from SD3E at GSFC to the Atmosphere PEATE at Wisconsin (124 mbps) was incorporated this period. This requirement is more than 7 x the previous GSFC requirement. Although the thruput was stable, this higher requirement results in a rating downgrade to "**Good**".

The user flow from GSFC averaged 77 mbps this period. Much of this flow was apparently NPP testing.

Testing from GES DISC for Terra, Aqua, and Aura flows was stable, and rated "**Excellent**". Testing from ENPL was also very stable. Thruput from NPP Mini IDPS at GSFC was similar to other GSFC sources.

Thruput from LaRC ANGe (LaTIS) was very stable; the rating from ANGe remains "**Excellent**".



16) Canada, Univ of Toronto:Rating: GSFC: Continued **Excellent**
LaRC: Continued **Excellent**

Team: MOPITT

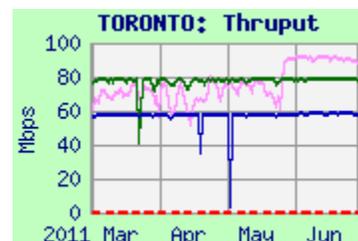
Domain: utoronto.ca

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	58.3	57.8	44.2	NISN / StarLight / CA*net4
LaRC PTH	78.9	78.3	57.1	
GSFC-ESDIS-PTH	87.8	76.4	50.5	MAX / I2 / NY / CA*net4

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 - '09	100	Excellent
GSFC EOC	'02 - '09	512	Excellent



Comments: Thruput from all sources to Toronto improved (especially the daily worst) and became less noisy in March – no longer a major diurnal cycle.

Thruput from GSFC-ESDIS-PTH improved in late May with the disabling of TSO.

Thruput from LaRC PTH was stable; LaRC ASDC DAAC was also stable but a bit lower. The ratings from both sources remain “**Excellent**”, due to the low requirements.

User flow from GSFC averaged only 1.3 kbps this period.

17) Canada: CCRS (Ottawa)

Teams: MODIS, CEOS

Web Page: <http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml>Rating: **Excellent**
Domain: ccrs.nrcan.gc.ca**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	80.5	77.3	71.7	MAX / I2 / CA*net4
GSFC-ENPL	99.0	98.8	98.5	

Requirement:

Source Node	FY	mbps	Rating
GSFC-MODAPS	'11 -	3.8	Excellent



The new MODIS requirement (3.8 mbps) is now incorporated for this site.

Performance from both sources improved in April and again in May with retuning. Thruput was much more than 3 x the requirement, so is rated “**Excellent**”.

User flow from GSFC averaged 2.4 mbps this period, consistent with the requirement.

18) Italy, EC - JRC:

Team: MISR

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

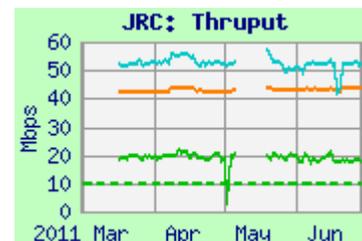
Domain: jrc.it

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	23.6	19.2	16.4	NISN / MAX / Géant / Garr
GSFC-NISN	54.6	52.5	47.9	
GSFC-ENPL	43.7	43.2	42.5	MAX / I2 / Géant / Garr

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'02 – '09	0.52	Excellent



Comments: JRC was connected to Géant in June '07, with significant performance improvement. NISN began peering with Géant in late September '09. Previously, the route from LDAAC was via NISN to StarLight in Chicago, then Canarie's ITN, peering with Géant in NY (but a high performance route anyway).

Thruput was stable from all sources this period. The median daily worst thrupt from LaRC ASDC DAAC remains well above 3 x the requirement, so the rating remains "**Excellent**".

Performance is similar from GSFC-NISN and GSFC-ENPL. LaRC flows now take a similar route as the GSFC nodes.

19) University of Auckland, New Zealand

Teams: MISR

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

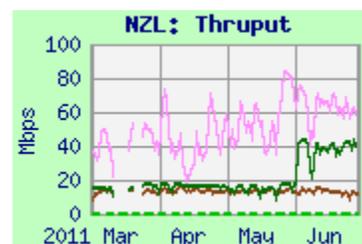
Domain: auckland.ac.nz

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	18.0	16.2	4.4	NISN / Chicago / I2 / PNW / PacWave
GSFC-ESDIS-PTH	75.6	54.5	23.5	MAX / I2 / PNW /
GSFC-ESTO	15.8	13.1	8.8	PacWave

Requirement:

Source Node	FY	mbps	Rating
LaRC	'11 -	0.3	Excellent



The new MISR requirement (0.3 mbps) is now incorporated for this site.

Thruput from LaRC-PTH improved at the beginning of June with retuning, but too late to affect the quarterly averages. Even so, with the low requirement, the rating is "**Excellent**".

Thruput was higher from GSFC-ESDIS-PTH, and improved in late May with disabling of TSO.

20) 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	33.0	30.9	14.4	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	26.0	16.9	9.0	MAX / I2 / Géant (DC) / JAnet
EROS-PTH	18.6	13.6	6.1	StarLight / I2 / Géant (DC) / JAnet

Requirements

Source Node	FY	mbps	Rating
LaRC DAAC	'02 – '09	1.03	Excellent

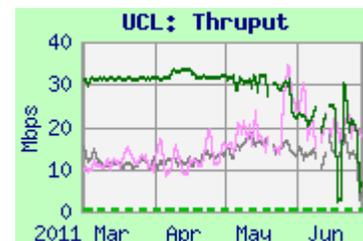
Comments: In September '06 the testing was modified due to a new firewall at UCL – using ftp pulls by UCL instead of iperf from GSFC and LaRC. Results were much lower using this method. These were replaced in November and December '10 by nuttcp pulls, with improved results.

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 was stable from all sources until mid May, when there were problems at UCL – cleared up in early July. The median daily worst thruput from LaRC remained well above 3 x the requirement, so the rating remains “**Excellent**”

From GSFC-ESDIS, thruput improved in late May with disabling of TSO.

Thruput from EROS is similar to the other sites, but a bit lower due to a longer RTT.

**21) UK, Oxford Univ.:**Rating: Continued **Good**

Team: HIRDLS

Domain: ox.ac.uk

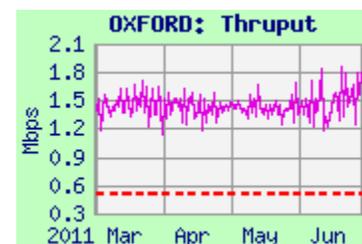
Web Page: <http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	1.94	1.43	0.92	MAX / I2 / Géant (DC) / JAnet

Requirements: (IST Only)

Source Node	FY	kpbs	Rating
GSFC	'03 – '09	512	Good

Comments: Testing resumed in April '10, but using “flood pings”, which is a poor substitute for iperf, and provides much lower results, now rated “**Good**”. User flow from GSFC to Oxford averaged 630 kbps for this period (vs. 450 last period).



Note: Testing to Oxford had been down since the old Oxford test host was retired (in April '08). At that time iperf performance had been mostly stable at about 25 mbps since October '06 (similar to BADC, below, which is similarly connected to JAnet), rating “**Excellent**”.

22) British Atmospheric Data Centre

(Rutherford Appleton Laboratory)

Team: HIRDLS

Rating: Continued **Excellent**

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-ENPL	29.4	21.4	14.8	MAX / I2 / Géant (DC) / JAnet
GSFC-ESDIS-PTH	14.3	9.7	7.3	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02 – '09	0.19	Excellent

Comments: Thruput from both sources became very noisy around 1 June; it stabilized again in mid July. Thruput from GSFC-ENPL was higher than from GSFC-ESDIS-PTH, due to packet loss on EBnet at GSFC until late May, when TSO was disabled on GSFC-ESDIS-PTH, and the thruput became similar on the two nodes. The thruput has consistently been much higher than the requirement, so the rating remains “**Excellent**”.

