

## **EOS Science Networks Performance Report**

This is a summary of EOS QA SCF performance testing for the 4<sup>th</sup> quarter of 2010 -- 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](http://ensight.eos.nasa.gov/active_net_measure.html). Or click on any of the site links below.

### **Highlights:**

- **GSFC: EBnet: 10 Gig upgrade substantially complete.**
- Mostly stable performance.
  - **ALL Nodes rated at least Good**
  - **GPA 3.86** (was 3.87 last quarter)
  - Performance to nodes at Universities dropped somewhat when the students returned in late August or September
- The Nov '07 requirements are used as the basis for the ratings
  - Requirements update is [still] in progress

### **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

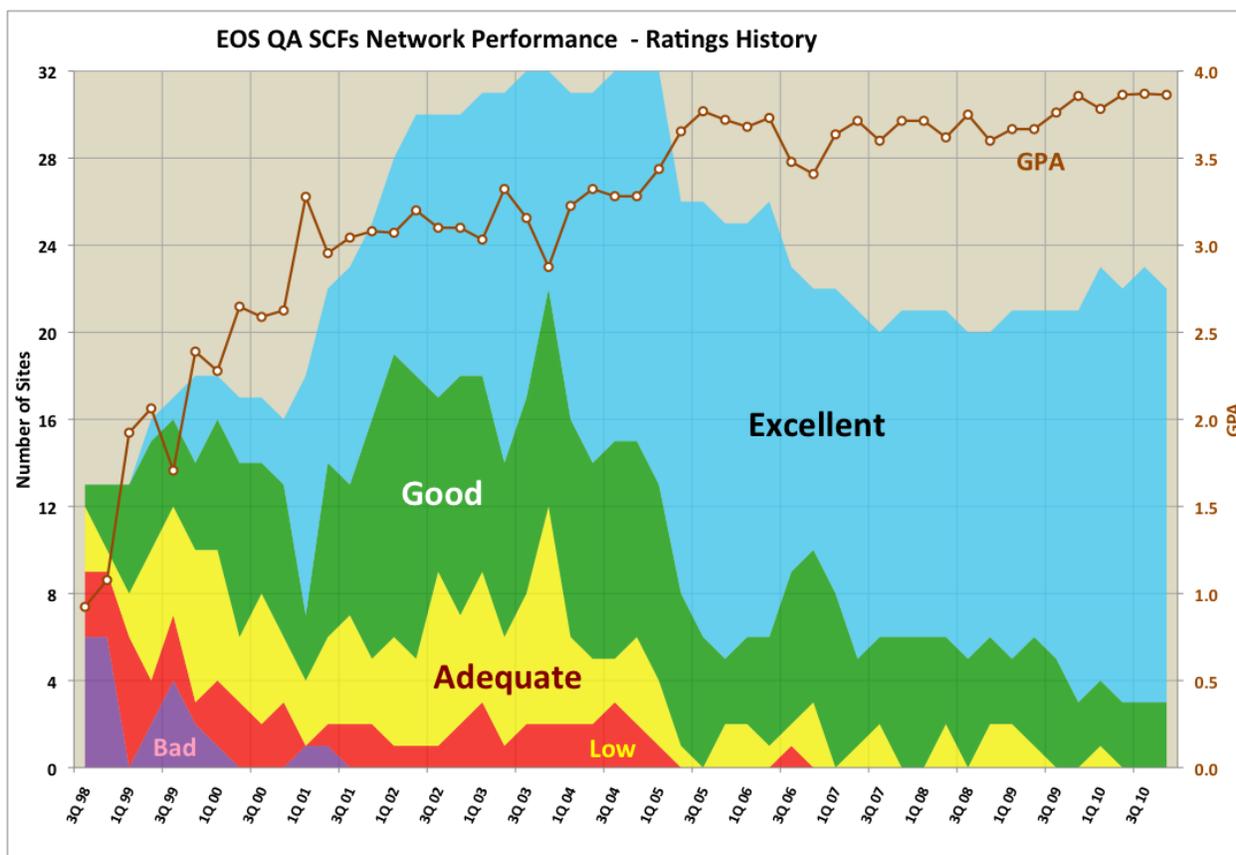
**Low**: median of daily medians < requirement.

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

**Ratings Changes:** None

**Ratings History:**

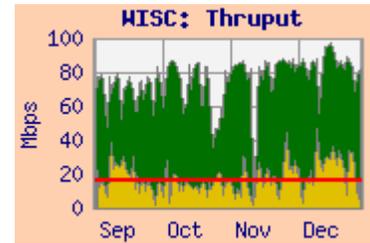
The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



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

- Moving the reporting for 6 SIPS sites to the “EOS Production Sites” Network Performance Report (2Q05).
- Testing discontinued to SAGE III Nodes (2Q06)
- Testing discontinued to NOAA and UMD (3Q06)
- Testing discontinued to U Washington (2Q07) and UIUC (4Q06)
- Testing to BADC (RAL) added in 2009.
- Testing to Oxford was restored in March, 2010.
- ICESAT functions of Ohio State were transferred to Buffalo. Testing to Buffalo added 1Q10; Ohio State dropped 2Q10.
- UIUC added [back] in 3Q10.
- Testing to MIT discontinued August 2010

**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.



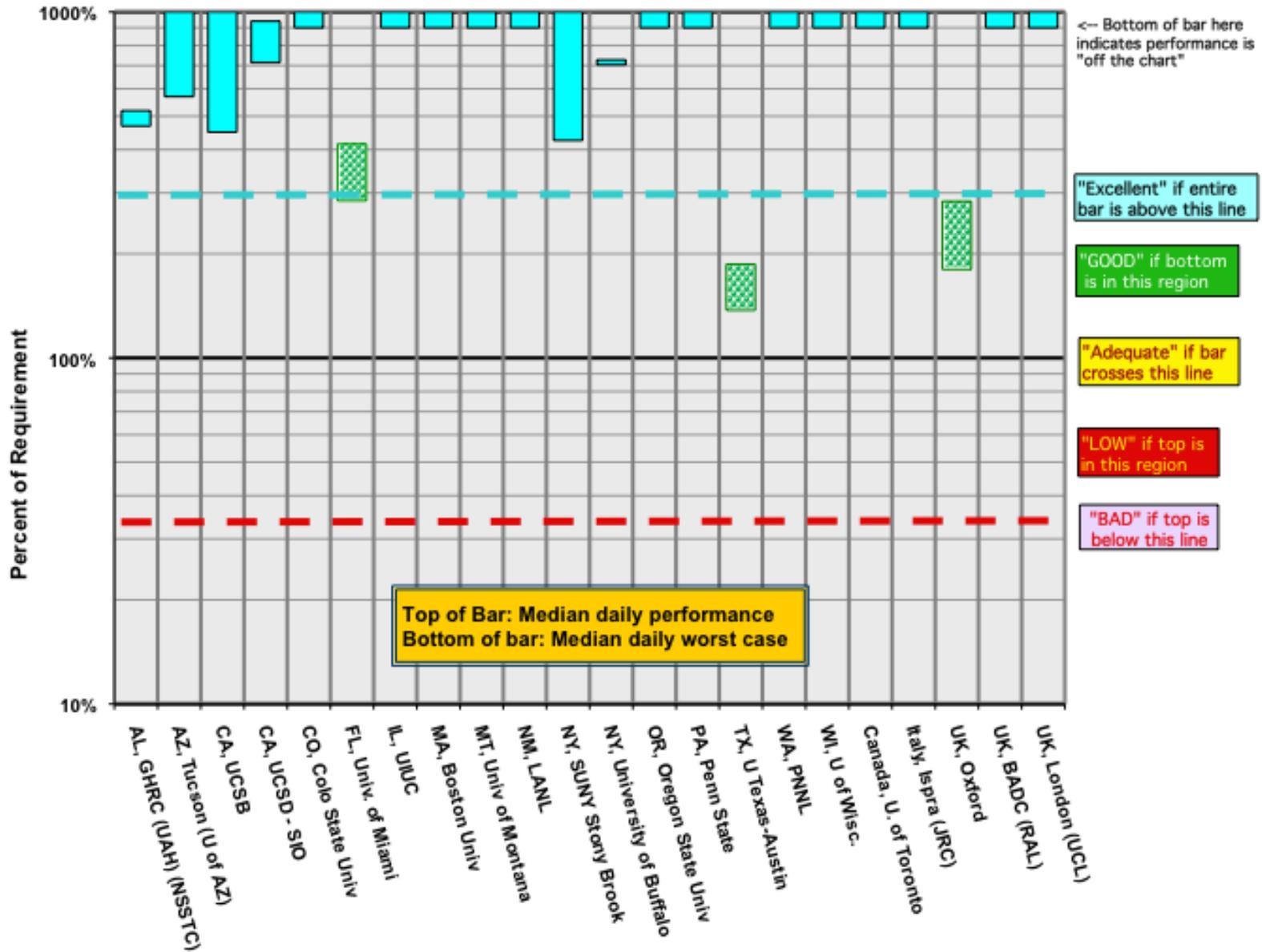
**Note:** User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs.

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

4 <sup>th</sup> Quarter 2010		Testing							
Destination	Team (s)	Requirement	Source Node	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		Route Tested
		Nov-07					4 Q 2010	3Q10	
AL, GHRC (UAH) (NSSTC)	CERES, ASTER, LIS	6.9	LaTIS	36.0	32.5		Excellent	Ex	NISN / MAX / Internet2 / SOX / UAH
AZ, Tucson (U of AZ)	MODIS	2.6	EROS LPDAAC	47.2	14.6		Excellent	Ex	StarLight (Chicago) / Internet2 / CENIC
CA, UCSB	MODIS	3.1	GSFC-MODIS	52.1	14.0	1.0	Excellent	Ex	MAX / Internet2 / CENIC
CA, UCSD - SIO	ICESAT, CERES	7.1	GSFC-ICESAT	66.8	50.7	0.2	Excellent	Ex	NISN / MAX / Internet2 / CENIC
CO, Colo State Univ	CERES	2.1	LaTIS	142.9	23.3		Excellent	Ex	NISN / MAX / Internet2 / FRGP
FL, Univ. of Miami	MODIS, MISR	18.8	GSFC-NISN-PTH	78.1	53.6	0.05	Good	Good	MAX / Internet2 / SOX
IL, UIUC	MISR	1.1	LaRC PTH	107.9	33.8		Excellent	Ex	Internet2 via NISN / MAX
MA, Boston Univ	MODIS, MISR	3.0	EROS LPDAAC	149.9	44.6	0.4	Excellent	Ex	StarLight (Chicago) / Internet2 / NOX
MT, Univ of Montana	MODIS	0.8	EROS LPDAAC	77.0	28.8	0.1	Excellent	Ex	StarLight (Chicago) / Internet2 / PNW
NM, LANL	MISR	1.0	LaRC DAAC	78.3	56.7		Excellent	Ex	NISN / MAX / Internet2
NY, SUNY Stony Brook	CERES	0.6	LaTIS	24.6	2.4		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet
NY, University of Buffalo	ICESAT	6.3	GSFC-ICESAT	45.8	44.3		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet
OR, Oregon State Univ	CERES, MODIS	7.6	LaTIS	113.4	92.2		Excellent	Ex	NISN / MAX / Internet2 / PNW
PA, Penn State	MISR	2.6	LaRC DAAC	152.7	80.6		Excellent	Ex	NISN / MAX / 3ROX
TX, U Texas-Austin	ICESAT	11.1	GSFC-ICESAT	20.6	15.2	0.11	Good	Good	NISN / MAX / Internet2 / TX-learn
WA, PNNL	MISR	1.4	LaRC PTH	161.6	70.9		Excellent	Ex	NISN / MAX / ESNet
WI, U of Wisc.	MODIS, CERES, AIRS, NPP	16.5	GES DISC	249.7	180.1	42.9	Excellent	Ex	MAX / Internet2 / MREN
Canada, U. of Toronto	MOPITT	0.6	LaRC DAAC	44.6	9.0		Excellent	Ex	NISN / StarLight (Chicago) / CA*net4
Italy, Ispra (JRC)	MISR	0.5	LaRC DAAC	19.6	17.1		Excellent	Ex	NISN / MAX / Géant (DC) / GARR
UK, Oxford	HIRDLS	0.5	GSFC-ENPL-PTH	1.5	0.9	0.27	Good	Good	Internet2 / Géant (DC) / JAnet
UK, BADC (RAL)	HIRDLS	0.2	GSFC-ESDIS-PTH	23.3	17.1		Excellent	Ex	Internet2 / Géant (DC) / JAnet
UK, London (UCL)	MISR, MODIS	1.0	LaRC PTH	30.4	20.7		Excellent	Ex	NISN / MAX / Géant (DC) / JAnet
							<b>Summary</b>		
<b>*Rating Criteria:</b>							Current:	Prev	
							4 Q 2010	Report	
Excellent	Median Daily Worst >= 3 * Requirement						19	20	
Good	Median Daily Worst >= Requirement						3	3	
Adequate	Median Daily Worst < Requirement <= Median Daily Median						0	0	
LOW	Median Daily Median < Requirement						0	0	
BAD	Median Daily Median < Requirement / 3						0	0	
							Total	22	23
							GPA	3.86	3.87

## 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

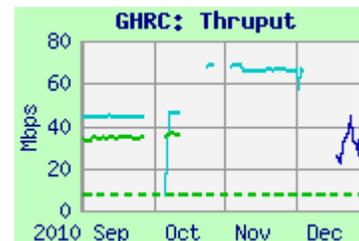
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml>

Rating: Continued **Excellent**

Domain: nsstc.uah.edu

#### Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-EDOS	49.1	33.3	16.0	NISN / MAX / I2 / SOX
GSFC-CNE	67.1	66.3	57.3	MAX / I2 / SOX



#### Requirements:

Source Node	FY	Mbps	Rating
LaRC ANGe	'06 – '09	7.0	<b>Excellent</b>

**Comments:** Testing from GSFC-CNE and LaRC was suspended in October when the old test node was retired. Testing using nuttcp was initiated to the new test node later in October with improved performance (testing resumed from LaRC in January). Median daily worst thruput remains above 3x the requirement, so the rating remains “**Excellent**”.

Testing was initiated in December from GSFC-EDOS for LANCE flows

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

### 2) AZ, Tucson (U of AZ):

Team: MODIS

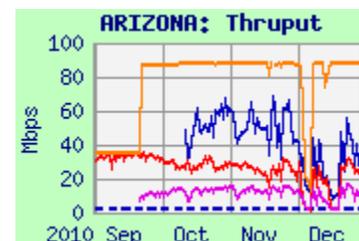
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml>

Rating: Continued **Excellent**

Domain: arizona.edu

#### Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	62.1	47.2	14.6	StarLight / I2 / CENIC
EROS PTH SCP	35.9	26.3	10.2	
GSFC ENPL	88.2	88.0	84.0	MAX / I2 / CENIC



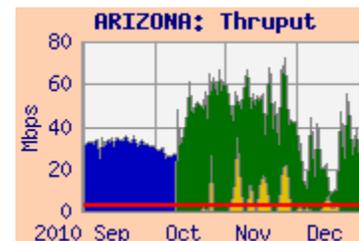
#### Requirements:

Source Node	FY	Mbps	Rating
EROS LPDAAC	'03 - '09	2.6	<b>Excellent</b>

**Comments:** The Arizona test node was replaced in July '10– initially only SCP tests were possible (iperf testing from EROS LPDAAC resumed in October). The median daily worst from EROS LPDAAC remained way above 3 x the requirement, so the rating remains “**Excellent**”.

From GSFC-ENPL, iperf testing was initiated to the replacement node in July, and was returned in September. Thruput is now slightly better than to the old node.

The average user flow from EROS was about 4 mbps, higher than the requirement..



**3) CA, UCSB :**

Teams: MODIS

Domain: ucsb.edu

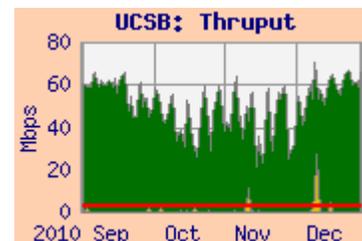
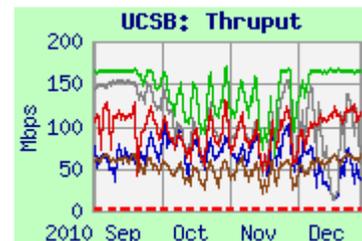
Web page: <http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml>Ratings: GSFC: Continued **Excellent**  
EROS: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	67.8	52.1	14.0	MAX / I2 / CENIC
GSFC-GES DISC	131.9	90.7	37.3	
GSFC-ENPL	167.8	141.2	61.5	
EROS-LPDAAC	100.0	66.0	21.7	StarLight / I2 / CENIC
EROS-PTH	136.0	93.7	26.3	

**Requirements:**

Source Node	FY	mbps	Rating
GSFC-MODIS	'04 - '09	3.1	<b>Excellent</b>
EROS-LPDAAC	'04 - '09	2.2	<b>Excellent</b>

**Comments:** The requirements are split between EROS and GSFC. Thruput from all sites remains noisy, with best:worst ratios from 2.3 to 5.2. Thruput from EROS LPDAAC improved with the removal of the EROS proxy firewall in May, but performance is still better from EROS-PTH (outside the ECS firewall). The rating remains “**Excellent**” from both EROS and GSFC-MODIS. The user flow from GSFC averaged a typical 1.0 mbps this period, fairly consistent with 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	76.9	66.8	50.7	NISN SIP / MAX / I2 / CENIC
LaRC ANGe (LaTIS)	167.6	167.0	159.5	
GSFC-ESDIS-PTH	111.8	91.4	61.2	MAX / I2 / CENIC
GSFC-ENPL	186.3	182.3	173.7	

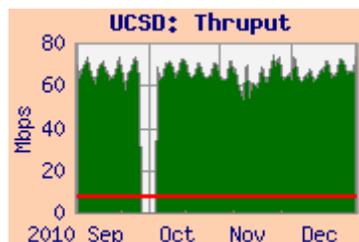
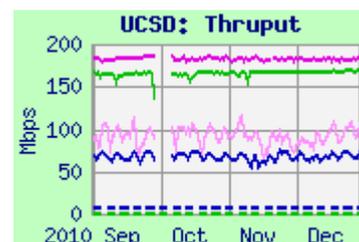
**Requirements:**

Source Node	FY	mbps	Rating
GSFC-ICESAT	'05 - '09	7.0	<b>Excellent</b>
ANGe	'02 - '09	0.26	<b>Excellent</b>

**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**”

Peak performance from GSFC-ENPL is better and very steady. GSFC-ESDIS-PTH replaced GSFC-EBnet-PTH in March '10 – performance was steady but lower than from GSFC-EBnet-PTH, apparently due to 0.6% packet loss inside EBnet. User flow from GSFC averaged only 215 kbps during this period, much lower than the requirement.

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.shtml](http://ensight.eos.nasa.gov/Missions/terra/COLO_ST.shtml)Rating: Continued **Excellent**

Domain: colostate.edu

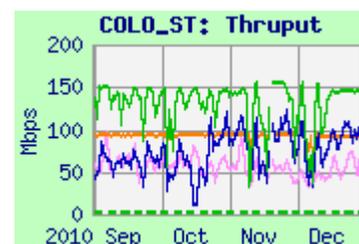
**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	151.6	142.9	23.3	NISN SIP / MAX / I2 / FRGP
GSFC-ICESAT	123.1	82.1	16.9	
GSFC-ESDIS-PTH	88.9	53.8	25.6	MAX / I2 / FRGP
GSFC-ENPL	93.1	93.0	38.9	

**Requirements:**

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

**Comments:** Thruput from all sources was moderately noisy, with large best:worst ratios. Performance from LaRC ANGe remained well above 3 x the requirement, so the rating remains “**Excellent**”. Testing from GSFC-ENPL is more stable, outside most GSFC campus firewalls, limited by its 100 mbps ethernet connection.

**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 **Good**LaRC: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	81.1	78.1	53.6	MAX / I2 / SOX
GSFC-MODIS-SCP	26.8	18.4	11.9	
LaRC PTH	67.3	64.7	56.6	NISN / MAX / I2 / SOX

**Requirements:**

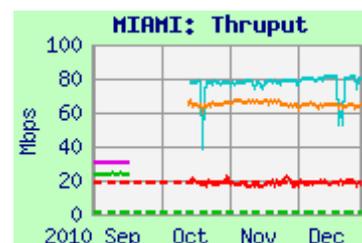
Source Node	FY	mbps	Rating
GSFC	'04 - '09	18.8	<b>Good</b>
LaRC ASDC	'04 - '09	1.1	<b>Excellent</b>

**Comments:** Miami replaced its test host in mid September, and testing was resumed in October.

Thruput from GSFC-NISN was mostly steady, and well above the requirement, but the average daily worst was slightly below 3x the requirement, so the rating remains “**Good**”.

SCP thruput from GSFC-MODIS was also mostly steady, although lower than iperf, as usual.

Thruput was also steady from LaRC PTH. The rating from LaRC remains “**Excellent**”, due to the much lower requirement.



### 7) IL, UIUC:

Teams: MISR

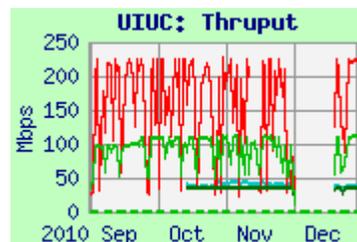
Web page: <http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml>

Rating: LaRC: **Excellent**

Domain: uiuc.edu

#### Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH-SCP	111.6	107.9	33.8	NISN / StarLight / I2
LaRC PTH	37.6	35.0	29.7	
GSFC-NISN-SCP	228.6	189.7	19.1	MAX / I2
GSFC-NISN	46.6	40.4	31.7	



#### Requirements:

Source Node	FY	mbps	Rating
LaRC ASDC	'04 -	1.1	<b>Excellent</b>

**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 from GSFC, but well above the requirement; so the rating remains **Excellent**.

In October 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

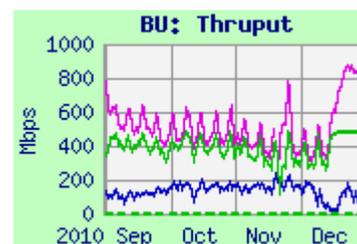
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/BU.shtml>

Ratings: EROS: Continued **Excellent**

LaRC: Continued **Excellent**

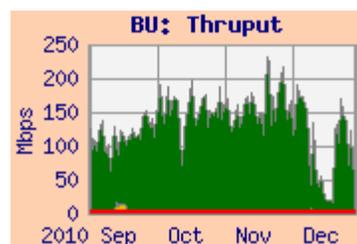
#### Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	195.9	149.9	44.6	StarLight / I2 / NOX
GSFC ENPL	839.6	472.3	273.6	MAX / I2 / NOX
LaRC ASDC	482.6	384.1	183.7	NISN / MAX / I2 / NOX

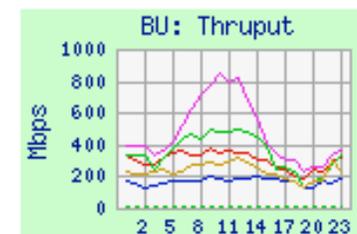


#### Requirements:

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



**Comments:** From **EROS LPDAAC**, thrupt was limited by packet loss at **EROS**, until the proxy firewall was removed in May. The user flow averaged about 0.4 mbps for this period (lower than the requirement without contingency). Thrupt from **GSFC** and **LaRC ASDC DAAC** greatly exceeded the requirements, and user flow from GSFC was an average of 2.9 mbps. Thrupt from all sources dropped in late August, when students returned, and acquired a significant diurnal component. The rating from both sources remains "**Excellent**".



**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

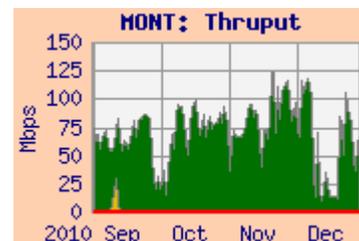
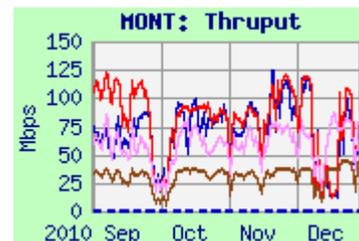
**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	98.3	77.0	28.8	StarLight / I2 / PNW
EROS PTH	95.8	84.8	41.6	
GSFC-ESDIS	83.8	63.5	44.5	MAX / I2 / PNW
NSIDC	38.0	34.1	22.9	CU / FRGP / I2 / PNW

**Requirement:**

Source Node	FY	mbps	Rating
EROS LPDAAC	'04 - '09	0.82	<b>Excellent</b>

**Comments:** Performance from most sources improved in May due to an upgrade at Montana, and again at the end of June with retuning. With the very low requirement, the rating remains "**Excellent**". The average user flow from EROS was only about 55 kbps – well below the requirement.

**10) NM, LANL**

Teams: MISR

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

Domain: lanl.gov

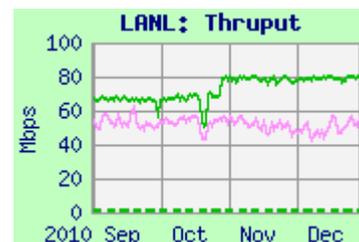
**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	82.6	78.3	56.7	NISN / MAX / I2
GSFC-ESDIS-PTH	60.4	51.6	40.3	MAX / ESnet

**Requirements:**

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'09	1.03	<b>Excellent</b>

**Comments:** Performance from LaRC ASDC DAAC was stable. With the low requirement, the rating remains "**Excellent**". From GSFC-ESDIS-PTH performance was lower, due to EBnet packet loss, but also stable.

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

Teams: CERES, MODIS

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

Domain: sunysb.edu

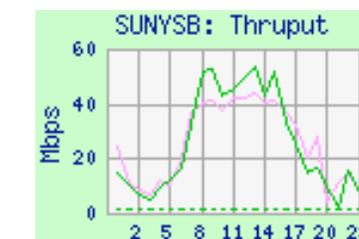
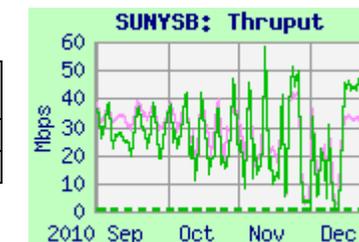
**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	56.1	24.6	2.4	NISN / MAX / I2 / NYSERnet
GSFC-ESDIS	43.5	29.5	4.2	MAX / I2 / NYSERnet

**Requirements:**

Source Node	FY	mbps	Rating
LaRC ANGe	'02-'09	0.57	<b>Excellent</b>

**Comments:** Performance from both sources acquired a significant diurnal component in September, with the arrival of the students. Previously, throughput from LaRC ANGe (LaTIS) had been stable since March '07. Due to the very low requirement, the rating remains "**Excellent**". From GSFC-ESDIS-PTH, performance was very similar.



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

Team: ICESAT

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

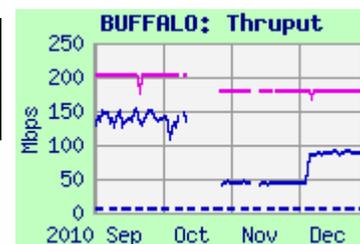
Domain: buffalo.edu

**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	87.6	45.8	44.3	NISN / MAX / I2 / NYSERnet
GSFC-ENPL	180.0	179.5	171.0	MAX / I2 / NYSERnet

**Requirements:**

Source Node	FY	mbps	Rating
GSFC-ICESAT	'09-'	6.3	<b>Excellent</b>



**Comments:** This node replaced Ohio-State for ICESAT, and assumes its requirement. The test node was replaced in October; performance is a bit lower from both sources. But the thrupt is well above 3 x the requirement, so the rating remains "**Excellent**".

**13) OR, Oregon State Univ:**

Teams: CERES, MODIS

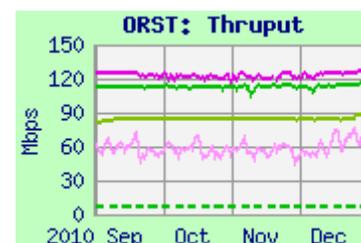
Domain: oce.orst.edu

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

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	114.2	113.4	92.2	NISN / MAX / I2 / PNW
JPL-PTH	84.8	84.3	82.3	CENIC / I2 / PNW
GSFC-ESDIS-PTH	73.8	57.2	41.8	MAX / I2 / PNW
GSFC-ENPL	125.8	122.3	112.6	

**Requirements:**

Source Node	FY	mbps	Rating
LaTIS	'04 - '09	7.5	<b>Excellent</b>
GES DISC	'02 - '09	0.25	<b>Excellent</b>



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

Thruput from **GSFC-ESDIS-PTH** was also stable, but lower than previously from **GSFC-EBnet-PTH**, due to **EBnet 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.

**14) PA: Penn State Univ:**

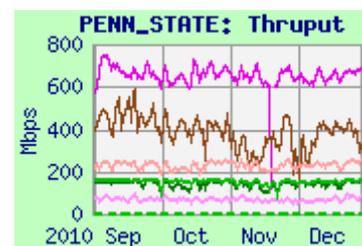
Team: MISR

Web Page: [http://ensight.eos.nasa.gov/Missions/terra/PENN\\_STATE.shtml](http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml)Rating: Continued **Excellent**

Domain: psu.edu

**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	162.2	152.7	80.6	NISN / MAX / I2 / 3ROX
LaRC-PTH	156.9	141.6	59.8	
GSFC-ESDIS-PTH	92.8	65.8	33.2	MAX / I2 / 3ROX
GSFC-ENPL	728.6	643.8	518.3	
GSFC-ESTO	489.5	375.9	210.4	

**Requirements:**

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'09	2.6	<b>Excellent</b>



**Comments:** Thruput from LaRC ASDC and LaRC-PTH dropped in mid January '10, corresponding to an increase in RTT. The forward route did not change, but the return route is now peering with NISN in Chicago! Performance improved in June due to retuning. Due to the low requirement, the rating remains "**Excellent**".

From GSFC-ESDIS-PTH, thrupt is stable and was similar to LaRC. It also sees the long return route, and has EBnet packet loss.

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 thrupt than other sources.

**15) TX: Univ. of Texas - Austin:**

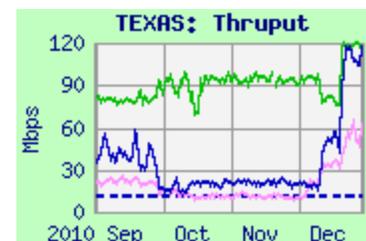
Team: ICESAT

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

Domain: utexas.edu

**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	28.2	20.6	15.2	NISN / MAX / I2 / TX
GSFC-ENPL-PTH	105.2	93.6	62.3	
GSFC-ESDIS-PTH	19.8	11.8	7.1	MAX / I2 / TX

**Requirements:**

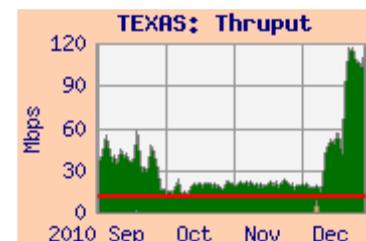
Source Node	FY	mbps	Rating
GSFC-ICESAT	05-'09	11.1	<b>Good</b>

**Comments:** Thruput from all sources improved in December, with a server upgrade. The daily minimum thrupt from ICESAT remains above the requirement, so the rating remains "**Good**".

Thruput from GSFC-ESDIS-PTH was also stable, but lower due to EBnet packet loss.

From GSFC-ENPL, outside most of the congested GSFC campus infrastructure, thrupt is much less noisy – and higher. It would be rated "Excellent".

The average user flow this period was only 105 kbps, only about 1% of the requirement.



**16) WA, PNNL:**

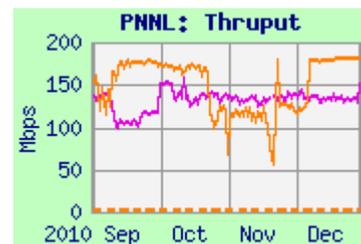
Team: MISR

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

Domain: pnl.gov

**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	178.6	161.6	70.9	NISN / MAX / ESnet
GSFC-ENPL	151.4	135.0	105.6	MAX / ESnet

**Requirements:**

Source Node	FY	mbps	Rating
LaRC	'04-'09	1.4	<b>Excellent</b>

**Comments:** Thruput from LaRC PTH was mostly stable,; the rating remains "**Excellent**". Performance from GSFC-ENPL was also stable.

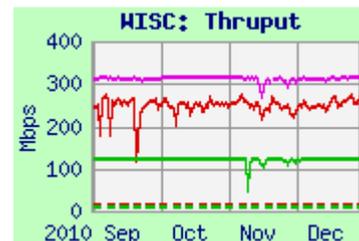
**17) WI, Univ. of Wisconsin:**

Teams: MODIS, CERES, AIRS, NPP

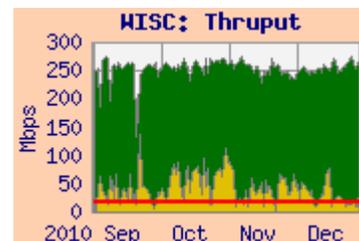
Domain: ssec.wisc.edu

Ratings: GSFC: Continued **Excellent**LARC: Continued **Excellent**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	316.1	257.9	191.1	MAX / I2 / MREN
LaRC ANGe	122.8	122.6	114.6	NISN / MAX / I2 / MREN
GSFC-ENPL	315.6	313.5	290.8	MAX / I2 / MREN

**Requirements:**

Source Node	FY	mbps	Rating
GSFC	'04 - '09	16.5	<b>Excellent</b>
LaRC Combined	'05 - '09	7.9	<b>Excellent</b>



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

The user flow from GSFC increased in November '09, and averaged 43 mbps this period (vs 26 mbps in Q3 and 36 mbps in Q2), well **above** the current requirement. Due to this high user flow, the rating is based on the integrated results from GSFC DISC, shown above. The integrated daily worst remained well above 3 x the requirement, so the rating remains "Excellent".

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

Testing from ENPL was also very stable.

**18) 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	56.7	44.6	9.0	NISN / StarLight / CA*net4
LaRC PTH	76.2	56.1	7.4	
GSFC-ESDIS-PTH	76.2	54.9	12.7	MAX / I2 / NY / CA*net4

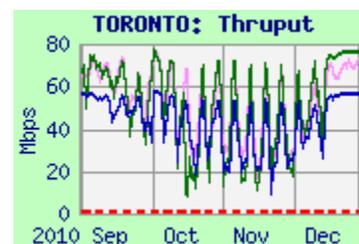
**Requirements:**

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

**Comments:** Thruput from all sources to Toronto became noisier again in September (students!), with a major diurnal cycle.

Thruput from **GSFC-ESDIS-PTH** was similar to **LaRC PTH**; **LaRC ASDC DAAC** was a bit lower. The ratings from both sources remain "**Excellent**", due to the low requirements.

User flow from GSFC averaged only 7 kbps this period.

**19) Italy, EC - JRC:**Rating: Continued **Excellent**  
Domain: jrc.it

Team: MISR

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

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	26.8	19.6	17.1	NISN / MAX / Géant / Garr
GSFC-NISN	54.9	53.0	49.6	
GSFC-ENPL	43.5	43.3	41.3	MAX / I2 / Géant / Garr

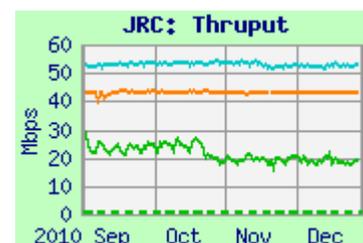
**Requirements:**

Source Node	FY	mbps	Rating
LaRC DAAC	'02 - '09	0.52	<b>Excellent</b>

**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 thruput from **LaRC ASDC DAAC** remain 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.



**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	32.4	30.4	20.7	NISN / MAX / Géant / JAnet
GSFC-ESDIS	19.7	12.4	8.5	MAX / I2 / Géant (DC) / JAnet
GSFC-ESDIS-ftp	6.3	4.9	3.4	
EROS-PTH	16.2	11.1	6.9	StarLight / I2 / Géant (DC) / JAnet

**Requirements**

Source Node	FY	mbps	Rating
LaRC DAAC	'02 – '09	1.03	<b>Excellent</b>

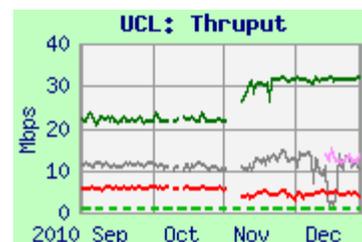
**Comments:** In September '06 the testing was modified due to a new firewall at UCL – using ftp pulls by UCL instead of iperf from GSFC and LaRC. Results were much lower using this method. These were replaced in November and December '10 by nuttcp pulls, with improved results.

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 improved from all sources due to the improved test protocol; the median daily worst thruput from LaRC remained well above 3 x the requirement, so the rating remains "**Excellent**".

From GSFC-ESDIS, thruput is reduced due to EBnet Packet loss.

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

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

Team: HIRDLS

Domain: ox.ac.uk

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

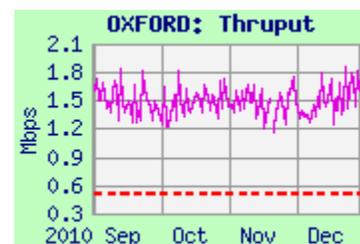
Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	2.34	1.45	0.92	MAX / I2 / Géant (DC) / JAnet

**Requirements: (IST Only)**

Source Node	FY	kbits	Rating
GSFC	'03 – '09	512	<b>Good</b>

**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 270 kbps for this period.

(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](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	37.1	35.3	26.3	MAX / I2 / Géant (DC) / JAnet
GSFC-ESDIS-PTH	28.7	23.3	17.1	MAX / I2 / Géant (DC) / JAnet

**Requirements:**

Source Node	FY	mbps	Rating
GSFC	'02 – '09	0.19	<b>Excellent</b>

**Comments:** Thruput to RAL was very stable from GSFC-ENPL. It was somewhat lower but also steady from GSFC-ESDIS-PTH. The thruput has consistently been much higher than the requirement, so the rating remains **Excellent**.

