

EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the 4th quarter of 2009 -- comparing the performance against the requirements, including Terra, TRMM, QuikScat, Aqua, Aura, ICESat, and GEOS requirements

Up to date graphical results can be found on the EOS network performance web site: http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the individual site links below.

Highlights:

- Continued congestion on the EBnet GigE
 - Affects daily worst performance from MODIS, GSFC-PTH, ISIPS, OMISIPS, others
 - Compare with better performance from GSFC-GES DISC
 - GSFC-GES DISC was moved to 10 gig EBnet in early June.
- Otherwise, mostly stable performance.
 - **ALL Nodes rated at least Good**
 - **GPA 3.86 – New record!** (was 3.76 last quarter)
- The Nov '07 requirements are used as the basis for the ratings
 - Requirements update is 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:

Upgrades: ↑ UCL: Good → **Excellent**

Colo State: Good → **Excellent**

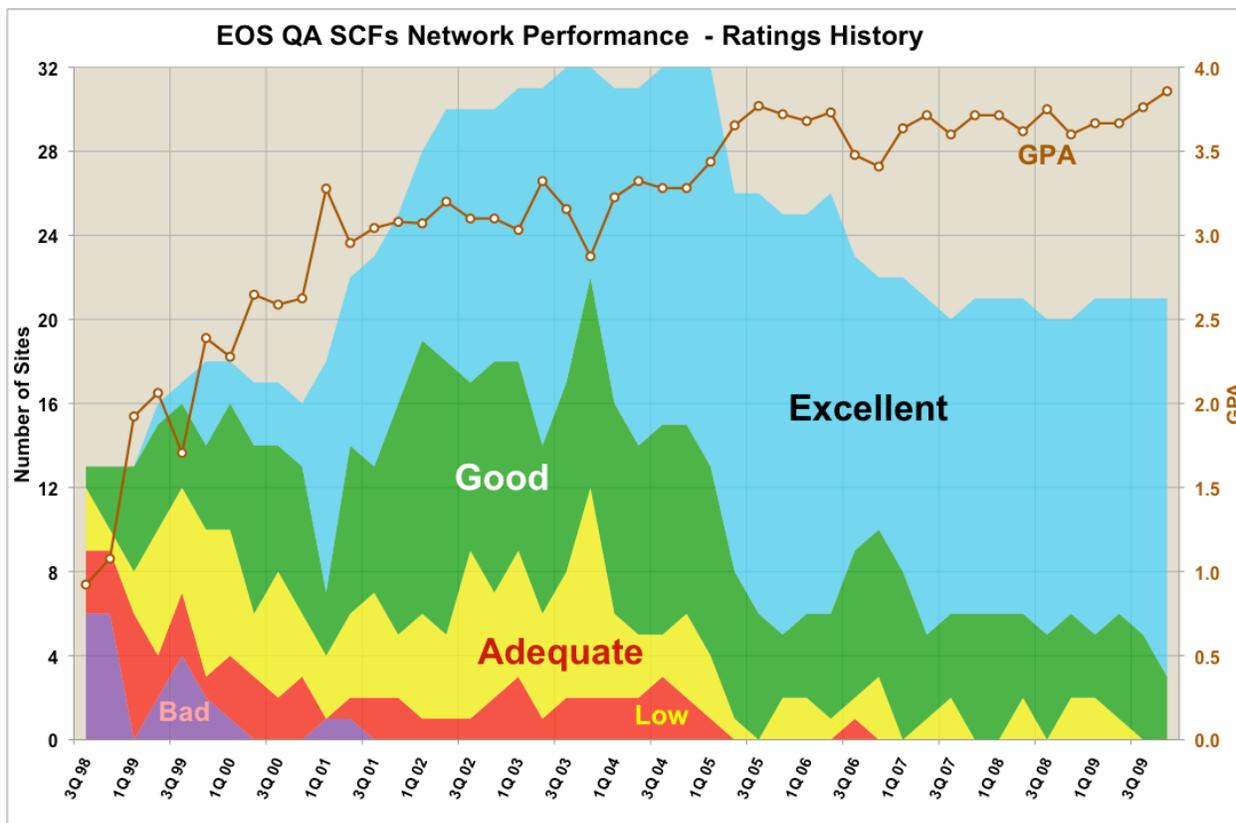
Downgrades: ↓ : None

Testing Suspended: X :

Oxford Univ: Replacement host being configured – S L O W L Y

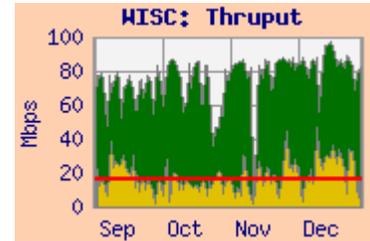
Ratings History:

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



Note that there are fewer sites included in this chart since 1Q'05 due to stopping of testing to U Washington (5/07) and UIUC (4Q06), discontinuation of tests to NOAA and UMD (3Q06), discontinuation of tests to SAGE III Nodes (2Q06), and moving the reporting for SIPS sites to the "EOS Production sites" performance report (2Q05). BADC was added in 2009.

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.



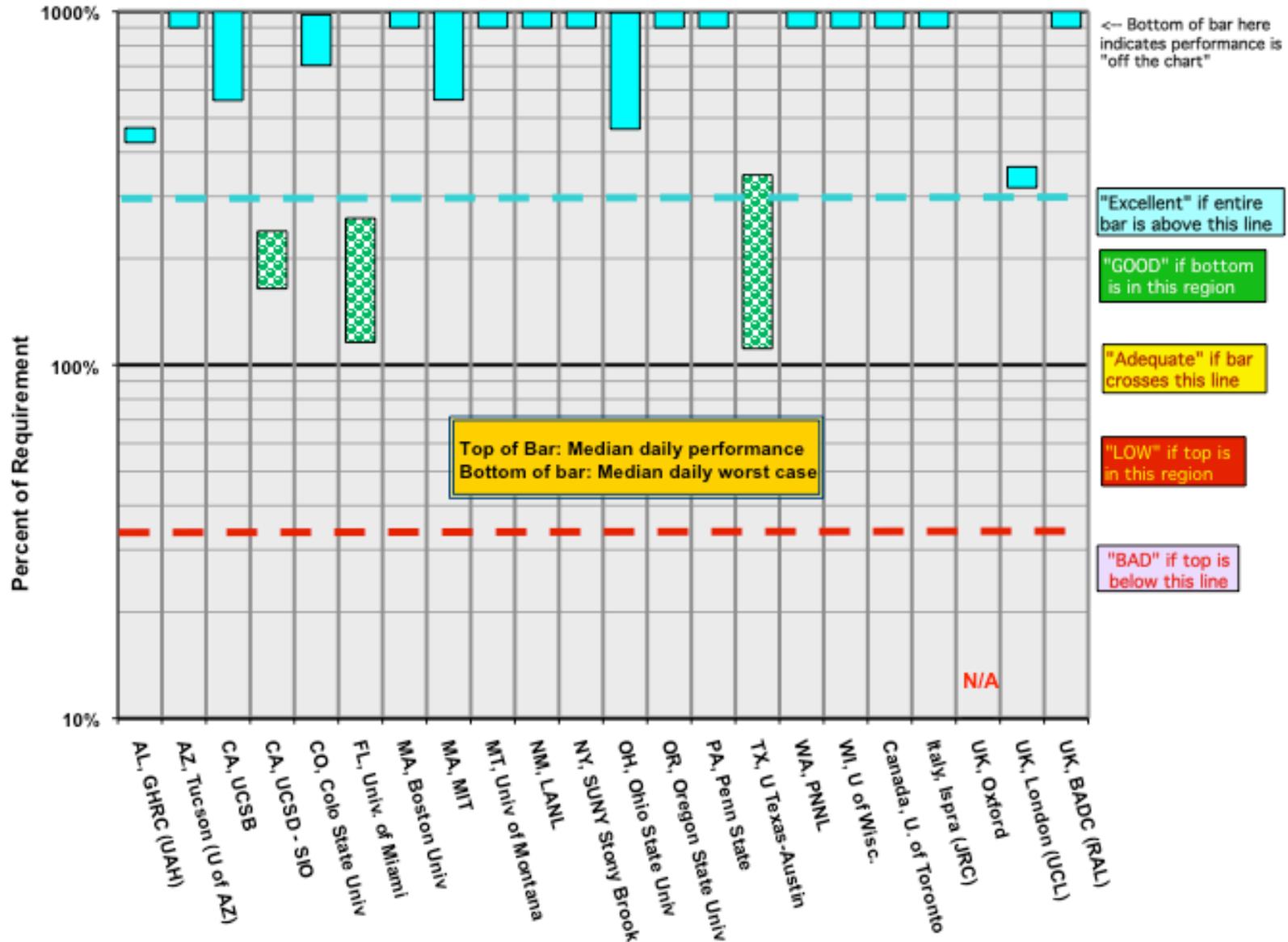
Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs.

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

4 th Quarter 2009			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 2009	3Q09	
AL, GHRC (UAH)	CERES, ASTER	6.9	LaTIS	32.5	29.6		Excellent	E	NISN / MAX / Internet2 / SOX
AZ, Tucson (U of AZ)	MODIS	2.6	EROS LPDAAC	37.8	25.0	2.0	Excellent	G	StarLight (Chicago) / Internet2
CA, UCSB	MODIS	3.1	GSFC-MODIS	45.5	17.5	0.4	Excellent	E	MAX / Internet2 / CENIC
CA, UCSD - SIO	ICESAT, CERES	7.1	GSFC-ICESAT	17.0	11.7	0.4	GOOD	G	NISN / MAX / Internet2 / CENIC
CO, Colo State Univ	CERES	2.1	LaTIS	21.0	15.1		Excellent	G	NISN / MAX / Internet2 / FRGP
FL, Univ. of Miami	MODIS, MISR	18.8	GSFC-MODIS	48.9	21.8	0.04	GOOD	G	MAX / Internet2 / SOX
MA, Boston Univ	MODIS, MISR	3.0	EROS LPDAAC	125.3	88.2	1.5	Excellent	E	StarLight (Chicago) / Internet2 / NOX
MA, MIT	ICESAT	7.0	GSFC-ICESAT	71.7	39.4	0.21	Excellent	E	NISN / MAX / Internet2 / NOX
MT, Univ of Montana	MODIS	0.8	EROS LPDAAC	41.4	15.1	0.4	Excellent	E	StarLight (Chicago) / Internet2 / PNW
NM, LANL	MISR	1.0	LaRC DAAC	27.4	18.4		Excellent	E	NISN / MAX / Internet2
NY, SUNY Stony Brook	CERES	0.6	LaTIS	38.2	25.4		Excellent	E	NISN / MAX / Internet2 / NYSERnet
NY, University of Buffalo	ICESAT		GSFC-ICESAT	54.1	24.0		n/a	n/a	NISN / MAX / Internet2 / NYSERnet
OH, Ohio State Univ	ICESAT	6.3	GSFC-ICESAT	62.6	29.3		Excellent	E	NISN / MAX / Internet2 / OARnet
OR, Oregon State Univ	CERES, MODIS	7.6	LaTIS	103.9	98.0		Excellent	E	NISN / MAX / Internet2 / PNW
PA, Penn State	MISR	2.6	LaRC DAAC	187.7	143.2		Excellent	E	NISN / MAX / 3ROX
TX, U Texas-Austin	ICESAT	11.1	GSFC-ICESAT	38.1	12.3	0.9	GOOD	G	NISN / MAX / Internet2
WA, PNNL	MISR	1.4	LaRC PTH	90.6	90.4		Excellent	E	NISN / MAX / ESNet
WI, U of Wisc.	MODIS, CERES, AIRS	16.5	GES DAAC	275.2	180.9	75.5	Excellent	E	MAX / Internet2 / MREN
Canada, U. of Toronto	MOPITT	0.6	LaRC DAAC	47.3	30.6		Excellent	E	NISN / StarLight (Chicago) / CA*net4
Italy, Ispra (JRC)	MISR	0.5	LaRC DAAC	46.8	39.4		Excellent	E	NISN / MAX / Géant (DC) / GARR
UK, Oxford	HIRDLS	0.0	GSFC-PTH				n/a	n/a	Internet2 / Géant (DC) / JAnet
UK, BADC (RAL)	HIRDLS	0.2	GSFC-PTH	27.8	12.4		Excellent	E	Internet2 / Géant (DC) / JAnet
UK, London (UCL)	MISR, MODIS	1.0	LaRC PTH	3.8	3.3		Excellent	G	NISN / MAX / Géant (DC) / Janet
*Rating Criteria:							Rating		
								Current:	Prev
								4 Q 2009	Report
Excellent	Median Daily Worst >= 3 * Requirement			Excellent			18	16	
GOOD	Median Daily Worst >= Requirement			GOOD			3	5	
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			21	21	
				GPA			3.86	3.76	

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

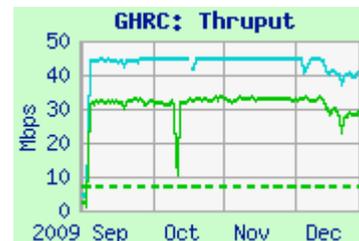
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml>

Rating: Continued **Excellent**

Domain: nsstc.uah.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC LaTIS	34.0	32.5	29.6	NISN / MAX / I2 / SOX
GSFC-CNE	45.0	44.7	43.4	MAX / I2 / SOX



Requirements:

Source Node	FY	Mbps	Rating
LaRC LaTIS	'06 – '09	7.0	Excellent

Comments: Performance from both sources was mostly very steady; median daily worst thrupt remains above 3x the requirement, so the rating remains "Excellent".

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

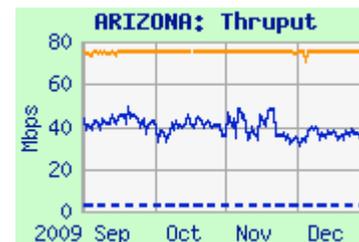
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml>

Rating: Continued **Excellent**

Domain: arizona.edu

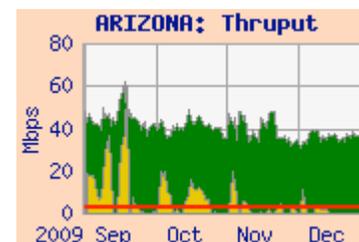
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	50.4	37.8	25.0	StarLight / I2
GSFC ENPL	75.3	75.0	72.7	MAX / I2



Requirements:

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



Comments: The ratings are based on the MODIS flow from EROS. Performance was stable from both sources -- the median daily worst from EROS remained way above 3 x the requirement, so the rating remains "Excellent".

The average user flow from EROS dropped back to the more usual 2.0 mbps – now close to the stated 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**

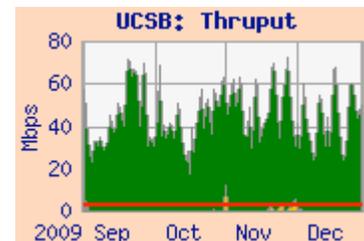
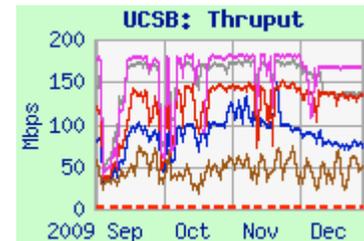
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	70.3	45.5	17.5	MAX / I2 / CENIC
GSFC-GES DISC	152.3	137.6	63.7	MAX / I2 / CENIC
GSFC-ENPL	182.4	178.5	65.7	MAX / I2 / CENIC
	105.9	92.9	52.6	StarLight / I2 / CENIC
EROS-PTH	172.0	168.0	113.4	StarLight / I2 / CENIC

Requirements:

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

Comments: The requirements are split between EROS and GSFC. Thruput from MODIS at GSFC **remains noisy due to the congested EBnet Gig-E**, while performance from ENPL and GES DISC (on the 10 gig EBnet backbone since June) is much less noisy. EROS LPDAAC has been stable since 2005, while EROS-PTH (outside the ECS firewall) has lower packet loss and higher thruput. The rating remains “Excellent” from both EROS and GSFC-MODIS. The user flow from GSFC averaged only 410 kbps this period, much lower than 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 **Good**
LaTIS: Continued **Excellent**

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	17.1	17.0	11.7	NISN SIP / MAX / I2 / CENIC
LaTIS	147.6	126.9	124.1	NISN SIP / MAX / I2 / CENIC
GSFC-EBnet-PTH	170.2	110.2	36.7	MAX / I2 / CENIC
GSFC-ENPL	184.8	184.5	184.2	MAX / I2 / CENIC

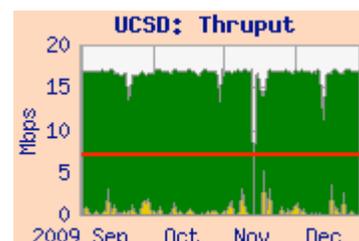
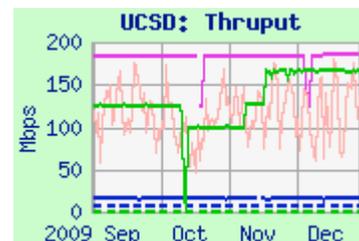
Requirements:

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

Comments: Performance from ICESAT is lower than other sources, due to its inability to send multiple concurrent streams (**fixed in February '10**). The daily minimum thruput from GSFC-ICESAT remained below 3 x the requirement, so the rating continues “Good”.

Peak performance from GSFC-EBnet-PTH is better, using multiple streams, but is also very noisy, **due to the 1 gig EBnet congestion**. GSFC-ENPL avoids the GSFC campus congestion, and gets very steady thruput. User flow from GSFC averaged only 430 kbps during the test period, **much lower than the requirement**.

Performance from LaTIS was also very stable, and improved with retuning. The LaTIS rating continues as “Excellent”.



5) CO, Colo State Univ.:

Teams: CERES, ICESAT

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

Domain: colostate.edu

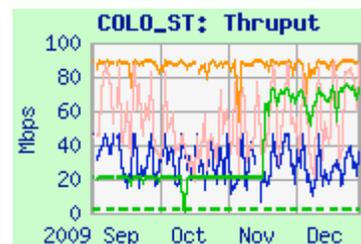
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	21.1	21.0	15.1	NISN SIP / MAX / I2 / FRGP
GSFC-ICESAT	45.9	28.2	5.5	NISN SIP / MAX / I2 / FRGP
GSFC-EBnet-PTH	88.8	46.8	12.8	MAX / I2 / FRGP
GSFC-ENPL	90.8	87.8	58.8	MAX / I2 / FRGP

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'04 - '09	2.15	Excellent

Comments: The daily worst from LaTIS improved to be above 3 x the requirement, so the rating improves to “Excellent”. Thruput from GSFC-PTH and GSFC-ICESAT had higher peaks but was also noisy due to congestion at both Colo and GSFC. Testing from GSFC-ENPL is outside most campus firewalls, and shows that the true capacity of the WAN is higher than seen from either the CNE or EBnet nodes.

**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-MODIS	62.0	48.9	21.8	MAX / I2 / SOX
GSFC-ENPL	30.5	30.3	27.8	MAX / I2 / SOX
LaRC DAAC	15.3	13.0	10.6	NISN / MAX / I2 / SOX

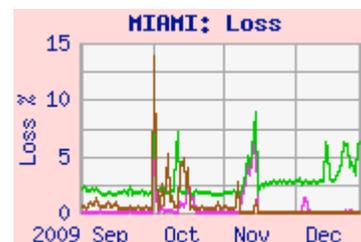
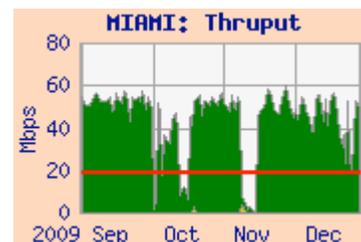
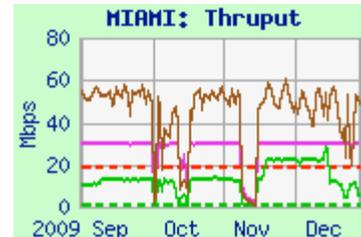
Requirements:

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

Comments: Thruput from GSFC-MODIS was mostly stable, but noisy due to EBnet congestion at GSFC. The integrated daily worst from MODIS remained above the requirement, so the rating remains “Good”. The rating remains “Excellent” from LaRC, due to the much lower requirement.

The integrated graph shows the user flow from GSFC averaged only 40 kbps, less than 1% of the requirement.

Note: Thruput was about 133 mbps from GSFC and 38 mbps from LaRC until Aug '05. An increase in packet loss was observed at that time. Since this loss is observed from all sources, and began from all sources at the same time, the problem appears to be in or near Miami.



7) MA, Boston Univ:

Teams: MODIS, MISR

Domain: bu.edu

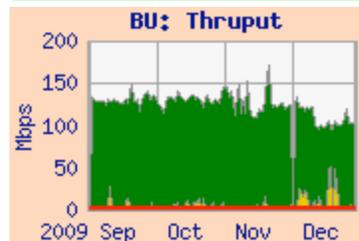
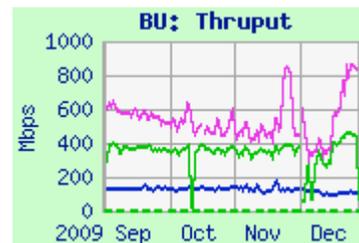
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/BU.shtml>Ratings: EROS: Continued **Excellent**
LaRC: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS DAAC	142.6	125.3	88.2	StarLight / I2 / NOX
GSFC ENPL	837.2	488.8	327.1	MAX / I2 / NOX
LaRC DAAC	391.8	355.8	203.4	NISN / MAX / I2 / NOX

Requirements:

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

Comments: The BU host was upgraded June '09, and the tests were retuned, with much higher thruput. The user flow from EROS averaged about 1.5 mbps for this period (close to the requirement without contingency), while there was an average of 1.6 mbps user flow from GSFC. The rating from both sources remains "Excellent".

**8) MA, MIT:**

Teams: ICESAT

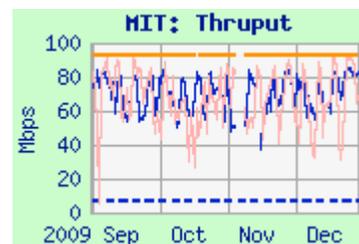
Web Page: <http://ensight.eos.nasa.gov/Missions/icesat/MIT.shtml>Rating: Continued **Excellent**
Domain: mit.edu**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	84.8	71.7	39.4	NISN / MAX / I2 / NOX
GSFC-EBnet-PTH	90.8	65.8	20.5	MAX / I2 / NOX
GSFC-ENPL	93.5	93.5	86.6	MAX / I2 / NOX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'05 - '09	7.0	Excellent

Comments: Performance from GSFC ICESAT and GSFC-EBnet-PTH to MIT is noisy but stable. The median daily worst is well above 3 x the requirement; the rating remains "Excellent". Peak performance from GSFC-ENPL is a bit better than from ICESAT, but the median and worst are substantially higher. The daily average user flow from ICESAT was only 200 kbps – only about 3% of the requirement



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

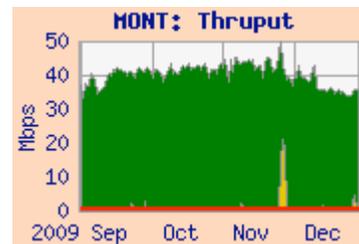
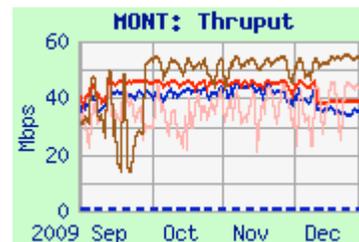
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	44.3	41.4	15.1	StarLight / I2 / PNW
EROS PTH	46.2	45.0	19.4	StarLight / I2 / PNW
GSFC-EB-PTH	45.3	36.9	7.6	MAX / I2 / PNW
NSIDC	54.8	52.5	14.6	CU / FRGP / I2 / PNW

Requirement:

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

Comments: Performance was relatively stable this period. With the very low requirement, the rating remains "Excellent". The average user flow from EROS was about 420 kbps – mostly in occasional bursts above the requirement.

**10) NM, LANL**

Teams: MISR

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

Domain: lanl.gov

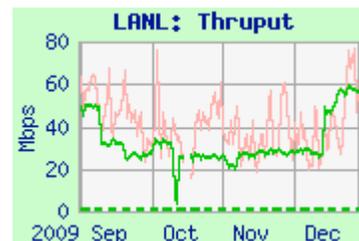
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	32.0	27.4	18.4	NISN / MAX / I2
GSFC-EBnet-PTH	68.4	37.6	11.3	MAX / ESnet

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03-'09	1.03	Excellent

Comments: Performance from LaRC was relatively stable – retuned in December. With the low requirement, the rating remains "Excellent". From GSFC performance was noisier due to EBnet congestion.

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

Teams: CERES, MODIS

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

Domain: sunysb.edu

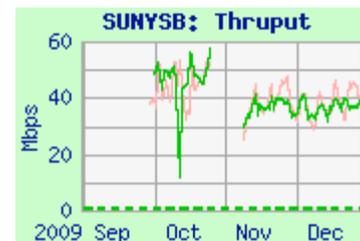
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	58.7	38.2	25.4	NISN / MAX / I2 / NYSERnet
GSFC	62.6	40.7	21.2	MAX / I2 / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'02-'09	0.57	Excellent

Comments: Performance from LaTIS has been stable since March '07. Due to the very low requirement, the rating remains "Excellent". Performance from GSFC was noisier but mainly stable this period. The SUNY test host went down in August, but testing was restored in October.



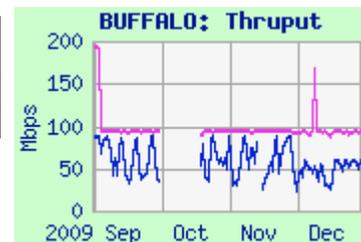
12) NY, University of Buffalo:

Team: ICESAT

Web Page: <http://ensight.eos.nasa.gov/Missions/icesat/BUFFALO.shtml>Rating: **N/A**
Domain: buffalo.edu**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	82.2	54.1	24.0	NISN / MAX / I2 / NYSERnet
GSFC-ENPL	93.6	93.1	86.6	MAX / I2 / NYSERnet

Comments: This node is planned to replace Ohio-State for ICESAT. Performance from both sources was relatively stable. No requirement is specified at this time, but if the requirement is the same 6.3 mbps as to Ohio State, the rating would remain "Excellent".

**13) OH, Ohio State Univ:**

Teams: ICESAT

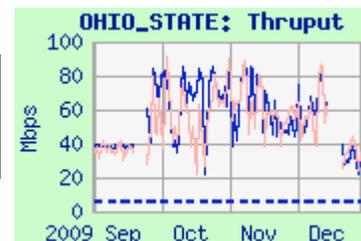
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/OHIO_STATE.shtmlRating: Continued **Excellent**
Domain: ohio-state.edu**Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	81.9	62.6	29.3	NISN / MAX / I2 / OARnet
GSFC-EBnet-PTH	87.8	56.7	19.2	MAX / I2 / OARnet

Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'05-'09	6.3	Excellent

Comments: Performance from both sources improved in late September, with a retuned destination host (and dropped back again in late December). The median daily worst thruput from ICESAT remained above 3 x the requirement; the rating therefore remains "Excellent". Performance from GSFC-EBnet-PTH was noisier due to EBnet congestion at GSFC.

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

Teams: CERES, MODIS Domain: oce.orst.edu

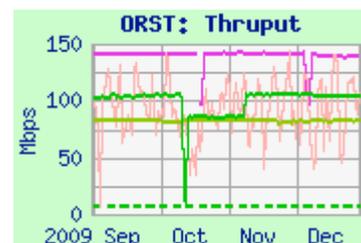
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml>Ratings: LaTIS: Continued **Excellent**
GSFC: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	105.2	103.9	98.0	NISN / MAX / I2 / PNW
JPL-PTH	83.4	82.6	80.1	CENIC / I2 / PNW
GSFC-EBnet-PTH	138.2	90.9	27.9	MAX / I2 / PNW
GSFC-ENPL	142.3	141.8	140.2	MAX / I2 / PNW

Requirements:

	FY	mbps	Rating
LaTIS	'04 - '09	7.5	Excellent
GES DISC	'02 - '09	0.25	Excellent

Comments: Thruput from LaTIS was mostly stable for this period, well above the requirement. Thruput from GSFC-EBnet-PTH is noisy due to EBnet to Doors congestion. 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. The ratings from both LaTIS and GSFC remain "Excellent".



15) PA: Penn State Univ:

Team: MISR

Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtmlRating: Continued **Excellent**

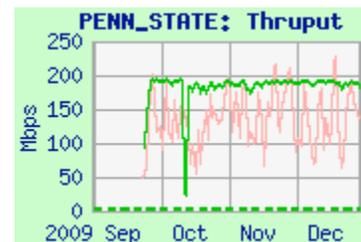
Domain: psu.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	193.0	187.7	143.2	NISN / MAX / I2 / 3ROX
GSFC-EBnet-PTH	224.8	135.6	42.8	MAX / I2 / 3ROX

Requirements:

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



Comments: Thruput from LaRC is very steady; the rating remains “Excellent”. Thruput from GSFC-PTH is noisy due to EBnet congestion.

16) TX: Univ. of Texas - Austin:

Team: ICESAT

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

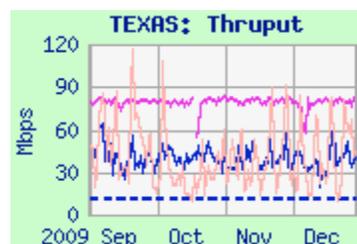
Domain: utexas.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	70.4	38.1	12.3	NISN / MAX / I2 / TX
GSFC-ENPL	90.7	79.6	56.4	MAX / I2/ TX
GSFC-EBnet-PTH	112.7	30.1	7.2	MAX / I2/ TX

Requirements:

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



Comments: Performance from ICESAT was noisy – similar to last quarter. The daily worst thruput remains above the requirement, but below 3 x; so the rating remains “Good”. Testing from GSFC-EBnet-PTH is very noisy, due to EBnet congestion. But GSFC-ENPL is outside most of the congested GSFC campus infrastructure – so it is much less noisy – would be rated “Excellent”. The average user flow this period was only 900 kbps, only about 8% of the requirement.

17) WA, PNNL:

Team: MISR

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

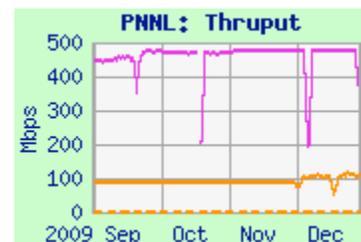
Domain: pnl.gov

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	90.6	90.6	90.4	NISN / MAX / ESnet
GSFC-ENPL	480.0	476.5	460.4	MAX / ESnet

Requirements:

Source Node	FY	mbps	Rating
LaRC	'04-'09	1.4	Excellent



Comments: Performance from LaRC PTH has been extremely stable, limited by a 100 mbps Ethernet connection at LaRC; the rating remains “Excellent”. Performance from GSFC-ENPL was also very stable, and remains **OUTSTANDING!**

18) WI, Univ. of Wisconsin:

Teams: MODIS, CERES, AIRS, NPP

Domain: ssec.wisc.edu

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

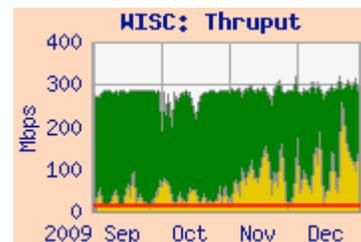
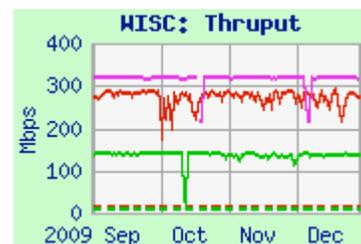
Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	350.9	286.4	206.5	MAX / I2 / MREN
LaTIS	139.9	137.4	115.0	NISN / MAX / I2 / MREN
GSFC-ENPL	319.5	318.5	315.2	MAX / I2 / MREN

Requirements:

	FY	mbps	Rating
GSFC	'04 - '09	16.5	Excellent
LaRC Combined	'05 - '09	7.9	Excellent

Comments: Performance from all nodes was very stable this period.

Thruput from GDAAC improved in June with GDAAC's move to the 10 gig EBnet, and was no longer noisy due to EBnet congestion at GSFC. The user flow from GSFC increased in November, and averaged 75 mbps this period (vs 30 mbps last period), over 4 x **above** the requirement. Due to this high user flow, the rating is based on the integrated results from GSFC, shown above. The integrated daily worst remained well above 3 x the requirement, so the rating remains "Excellent". Thruput from LaTIS was very stable; the rating from LaTIS remains "Excellent". Testing from ENPL also avoids the GSFC congestion and was also stable.

**19) Canada, Univ of Toronto:**

Team: MOPITT

Domain: utoronto.ca

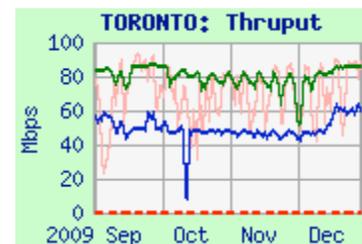
Web Page: <http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml>Rating: GSFC: Continued **Excellent**LaRC: Continued **Excellent****Test Results:**

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	62.1	47.3	30.6	NISN / StarLight / CA*net4
LaRC PTH	85.0	80.4	27.1	NISN / StarLight / CA*net4
GSFC-EBnet-PTH	90.2	72.1	22.9	MAX / I2 / NY / CA*net4

Requirements:

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

Comments: Thruput from LaRC to Toronto was stable. Testing from GSFC-EBnet-PTH is very noisy, due to EBnet congestion. The ratings from both sources remain "Excellent", due to the low requirements. User flow from GSFC averaged only 1.2 kbps this period.



20) Italy, EC - JRC:

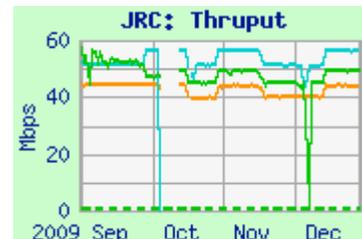
Team: MISR

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 DAAC	49.7	46.8	39.4	NISN / MAX / Géant / Garr
GSFC-NISN	56.5	56.1	50.7	NISN / MAX / Géant / Garr
GSFC-ENPL	44.7	43.4	39.2	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).

The median daily worst thruput from LaRC remained well above 3 x the requirement, so the rating remains "Excellent".

Performance is similar from both GSFC nodes, which now take similar routes as LaRC.

21) UK, London: (University College)

Teams: MODIS, MISR

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

Domain: ucl.ac.uk

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	3.9	3.8	3.3	NISN / MAX / Géant / JAnet
GSFC EBnet-PTH	3.7	2.9	1.9	MAX / I2 / Géant (DC) / JAnet
EROS-PTH	3.0	2.9	2.7	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 – now using ftp pulls by UCL instead of iperf from GSFC and LaRC.

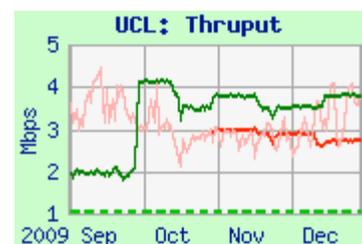
Results are much lower using this method – previous iperf thruput was 9.5 mbps from LaRC and 32 mbps from GSFC.

NISN began peering with Géant in late September '09, with improved thruput.

Previously, the route from LDAAC was via NISN peering with Teleglobe on the US west coast, unnecessarily increasing RTT and reducing thruput. Thruput was mostly stable, the median daily worst thruput from LaRC improved to be above 3 x the requirement, so the rating improves to "Excellent"

From GSFC the route (peering with Géant at MAX) is optimum. The thruput is better, but is noisy due EBnet congestion at GSFC.

Testing was added from EROS, based on a request from UCL. Thruput is similar to the other sites.



22) UK, Oxford:

Team: HIRDLS

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

Domain: ox.ac.uk

Test Results:

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

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 – '09	512	n/a

Comments: Testing to Oxford has been down since the Oxford test host was retired in April '08— a new host has been identified and configured, but testing is apparently blocked by a firewall. Previously, performance had been mostly stable at about 25 mbps since October '06, rating “Excellent”.

22A) Rutherford Appleton Laboratory (BADC)

Team: HIRDLS

Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtmlRating: Continued **Excellent**

Domain: rl.ac.uk

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	36.7	35.6	31.1	MAX / I2 / Géant (DC) / JAnet
GSFC-EBnet-PTH	34.4	27.8	12.4	MAX / I2 / Géant (DC) / JAnet

Requirements:

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

Comments: Thruput to RAL was very stable from GSFC-ENPL, but noisier. from GSFC-PTH, due to EBnet congestion at GSFC. The thrupt has consistently been much higher than the requirement, so the rating remains “Excellent”.

