EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for September and October 2002 -- comparing the performance against the requirements from BAH, including Terra, TRMM, and QuikScat, Aqua, ADEOS II, partial Aura and SAGE III, and ICESat requirements

Up to date graphical results can be found on the EOS network performance web site (now pretty stable): http://corn.eos.nasa.gov/performance/networks (Then click on a category next to "Active Testing")

Highlights:

- NISN fixed the apparent congestion for all NISN outflows from LaRC, on Sept 13 (had started 28 August) – it had caused noisy performance, and reduced daily worst measurements.
- Otherwise mostly stable performance – few changes
- Working with BAH to incorporate updated requirements for FY'03 and beyond--hopefully next month. Still using FY'02 for now.

Change History:

- June 2001: The requirements were modified to incorporate an updated number of EOS funded users at each tested site, based on the latest SPSO database. The total number of users increased in this way from 434 to 1012 (US only).
- May 2001: The requirements were increased by adding a 50% contingency factor to all QA and SIPS requirements, which were omitted with the change to the new BAH requirements in March 2001.

Ratings:

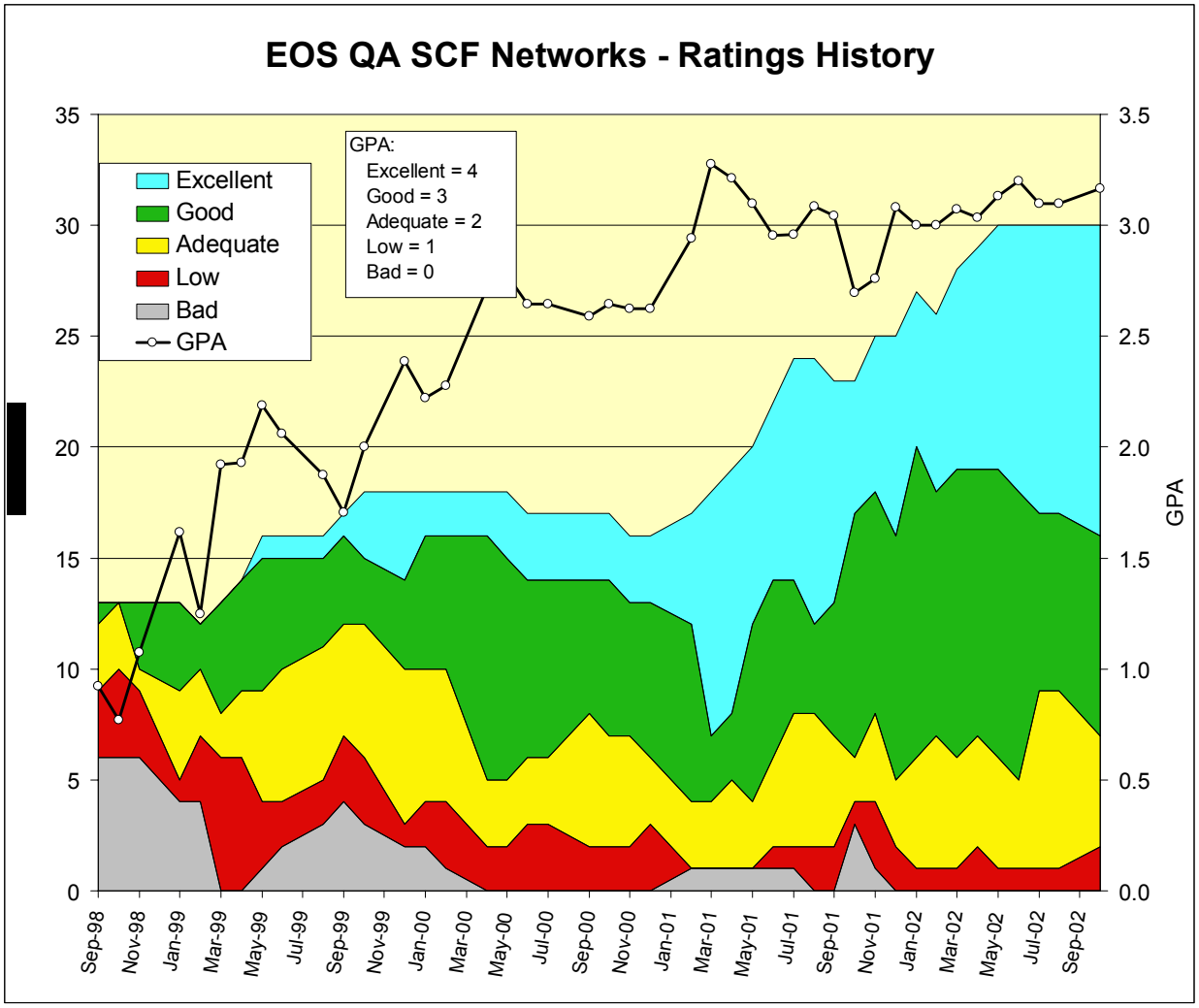
Rating Categories:

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.

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



Ratings Changes:

Upgrades: ↑

Arizona: Adequate → **Excellent**
Miami: Adequate → **Good**
Wisconsin: Good → **Excellent**
UCL: Adequate → **Good**

Downgrades: ↓

UCSD: Good → **Low**
JPL-MISR: Adequate → **Low**
Ohio State: Excellent → **Good**

EOS QA SCF Sites:

Network Requirements vs. Measured Performance

October 2002		Requirements (kbps)			Testing							
Destination	Team (s)	Previous: FY '01	Current: FY '02	Future: FY '03	Source Node: Test Period	Median kbps	Median Daily Worst	Current Rating* (FY '02)	Last Month	Future Rating* (FY '03)	Route Tested	Upgrade
AL, NSSTC (UAH)	CERES, AMSR	1809	2154	8485	LaTIS: 01-Sep-02 - 31-Oct-02	5310	4064	GOOD	G	LOW	NISN + FDDI	
AZ, Tucson (U of AZ)	MODIS, ~~MISR~~	3503	2506	2628	EDC: 13-Aug-02 - 31-Oct-02	12928	10309	Excellent	A	Excellent	Abilene via MAX	
CA, JPL (from LaRC)	MISR	8762	11192	14258	DAAC-MISR-ATM: 02-Sep-02 - 31-Oct-0	10708	1419	LOW	A	LOW	NISN Private VC	Increase VC
CA, JPL (from GSFC)	AIRS, TES, others	5144	17556	6713	GDAAC-AIRS: 26-Sep-02 - 31-Oct-02	14901	4399	LOW	L	Adequate	NISN SIP	Increase VC
CA, RSS	AMSR	200	376	380	JPL PODAAC: 08-Aug-02 - 31-Oct-02	2172	1377	Excellent	E	Excellent	2 * T1 - Consolidated	
CA, UCSB	MODIS	2453	3583	4336	GDAAC: 16-Oct-02 - 31-Oct-02	11586	8996	GOOD	G	GOOD	Abilene via NISN-MAX	
CA, UCSD - SIO	ICESAT, CERES	1200	6225	6225	GSFC: 25-Oct-02 - 31-Oct-02	27930	9444	GOOD	G	GOOD	Abilene via MAX	
CO, Colo State Univ	CERES	1758	1665	1851	LaTIS: 01-Sep-02 - 31-Oct-02	2614	1361	Adequate	A	Adequate	NISN -> Abilene	
CO, NCAR - Boulder	MOPITT, HIRDLS	4681	4716	4768	LaRC DAAC: 14-Sep-02 - 31-Oct-02	14110	3491	Adequate	A	Adequate	NISN -> Abilene	
FL, Univ. of Miami	MODIS, MISR	4165	9661	13326	GSFC: 14-Sep-02 - 31-Oct-02	52293	19867	GOOD	A	GOOD	Abilene via MAX	
IL, UIUC	MISR	1134	1134	1134								
MA, Boston Univ	MODIS, MISR	1207	1967	2474	EDC DAAC: 03-Oct-02 - 31-Oct-02	51825	24106	Excellent	E	Excellent	Abilene via vBNS+	
MA, MIT	ICESAT	1700	1700	1700	GSFC : 01-May-02 - 31-Oct-02	6812	5915	Excellent	E	Excellent	Abilene via MAX	
MD, UMD-College Park	MODIS	1928	1969	1997	GSFC-MAX: 01-Jan-02 - 31-Oct-02	151876	129370	Excellent	E	Excellent	Direct Fiber	
MT, Univ of Montana	MODIS	244	459	603	EDC DAAC: 23-Sep-02 - 31-Oct-02	19056	6959	Excellent	E	Excellent	Abilene via vBNS+	
NM, LANL	MISR	478	616	755	LaRC DAAC: 08-Aug-02 - 31-Oct-02	14083	3796	Excellent	E	Excellent	ESNet via ARC	
NY, SUNY Stony Brook	CERES	544	536	551	LaTIS: 10-Aug-02 - 31-Oct-02	16827	5696	Excellent	E	Excellent	NISN -> Abilene via MAX	
OH, Ohio State Univ	ICESAT	400	5425	5425	GSFC: 25-Sep-02 - 31-Oct-02	22822	9656	GOOD	E	GOOD	Abilene via MAX	
OR, Oregon State Univ	CERES, MODIS	5007	4390	5666	LaTIS: 01-Oct-02 - 31-Oct-02	11021	6684	GOOD	G	GOOD	NISN -> Abilene	
PA, Penn State	MISR	1947	2121	2295	LaRC DAAC: 01-Aug-02 - 31-Oct-02	21778	5519	GOOD	G	GOOD	NISN -> Abilene	
TX, Texas A&M	AMSR	400	400	400								
TX, U Texas-Austin	ICESAT	700	8755	7350	GSFC: 01-Feb-02 - 31-Oct-02	45363	34217	Excellent	E	Excellent	Abilene via MAX	
VA, LaRC - SAGE III MC	SAGE III	200	200	200	GSFC-CSAFS: 01-Apr-02 - 31-Oct-02	3889	1251	Excellent	E	Excellent	Abilene via NISN-MAX	
WA, NOAA PNNL	MISR	400	400	400								
WA, U Washington	ICESAT	2400	10920	10920	GSFC: 01-Oct-02 - 31-Oct-02	18921	10713	Adequate	G	Adequate	Abilene via MAX	
WI, U of Wisc.	MODIS, AIRS	4599	9135	12152	GSFC-MODIS: 29-Aug-02 - 31-Oct-02	52872	27635	Excellent	G	GOOD	Abilene via MAX	
Brazil, INPE	HSB	0	622	622	GSFC: 27-Jun-02 - 31-Oct-02	680	301	Adequate	A	Adequate	bilene -> AMpath-> ANSP	
Canada, U. of Toronto	MOPITT	441	456	471	LARC DAAC: 14-Jul-02 - 31-Oct-02	1420	933	GOOD	G	GOOD	NISN T1	NISN-CA*net3
France, Palaiseau	CERES	204	203	204								
Italy, Ispra (JRC)	MISR	237	308	1923	LaRC DAAC: 13-Mar-02 - 31-Oct-02	658	133	Adequate	A	LOW	NISN-UUNET-Milan	
Netherlands (KNMI)	OMI	0	0	311	GSFC: 21-Sep-02 - 31-Oct-02	3566	3510	Excellent	E	Excellent	Abilene --> Chi -> Surfnet	
Russia, Moscow (CAO)	SAGE III	26	26	26	CAO-LaRC-N: 04-Jul-02 - 31-Oct-02	157	147	Excellent	E	Excellent	NISN -> Moscow	
UK, Oxford	HIRDLS	0	0	311	GSFC: 02-Sep-02 - 16-Oct-02	3987	3209	Excellent	E	Excellent	Abilene->JAnet (NY)	
UK, London (UCL)	MISR, MODIS	478	616	755	LDAAC-UCL-SCF: 09-Sep-02 - 31-Oct-02	2162	1256	GOOD	A	GOOD	Abilene->JAnet (NY)	

*Rating Criteria:		Rating	Current Score	Prev. Score	re FY '03 Score
Excellent	Median of Daily worst hours >= 3 *Requirement	Excellent	14	13	13
GOOD	Median of Daily worst hours >= Requirement	GOOD	9	8	9
Adequate	Median of Daily worst hours < Requirement <= Median of Daily Medians	Adequate	5	8	5
LOW	Requirement > Median of Daily Medians	LOW	2	1	3
BAD	Requirement > 3 * Median of Daily Medians	BAD	0	0	0
		Total	30	30	30
		GPA	3.17	3.10	3.07

Change History:		
	8-Jun-98	Original
	10-Jul-98	Incorporated new MISR QA flows
	10-Sep-98	Added % of requirements columns and associated chart
	28-Oct-99	Added Previous Status Column
	1-Jul-00	Added "Excellent" Status, Ratings Summary Chart
	10-Apr-01	Updated requirements with BAH, added additional sites and missions
	7-Jun-01	Added ICESAT sites and requirements, added contingency to QA and SIPS
	13-Jul-01	Updated requirements for latest # of users

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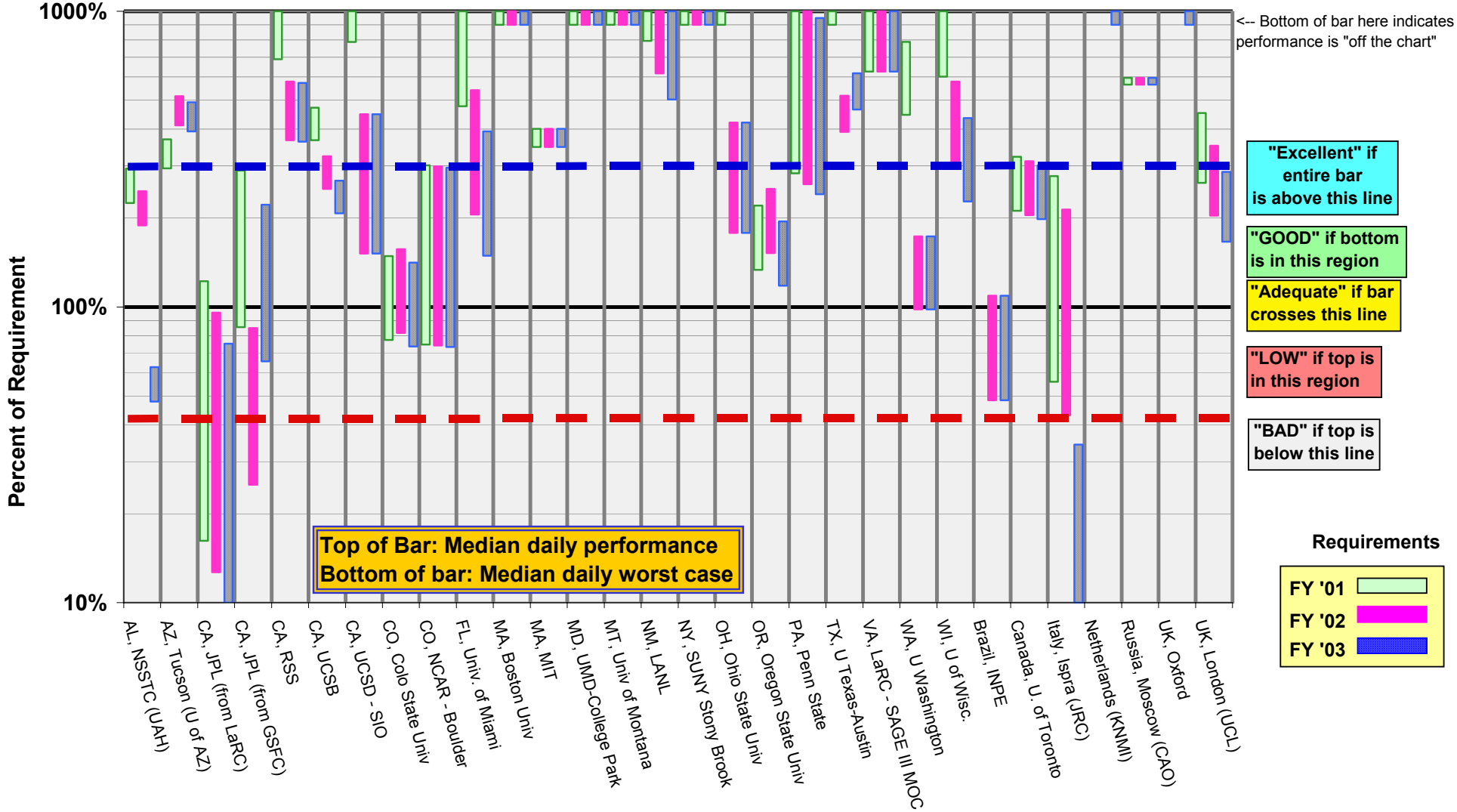
EOS QA SCF Sites

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, NSSTC (UAH) (aka GHCC)

Rating: Continued **Good**

Teams: CERES, AMSR

Domain: nsstc.uah.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC LaTIS	6.3	5.3	4.1	NISN SIP
GSFC	21.2	20.6	16.1	NISN SIP

Requirements:

Source Node	FY	mbps	Rating
LaRC LaTIS	'02, '03	1.8	Good

Comments: The new test node (as of July 26) has higher performance (not limited by 10M Ethernet, as previously), both from LaTIS (Median was 4.1 mbps) and GSFC (median was 4.7 mbps). Performance increased from GSFC increased from a median of 17.5 on September 16.

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2) AZ, Tucson (U of AZ):

Rating: ↑ Adequate → **Excellent**

Teams: MODIS, ~~MISR~~

Domain: arizona.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC	15.8	12.9	10.3	Abilene via vBNS+ / Chicago
LaRC DAAC	20.6	111.9	6.1	Abilene via NISN / Chicago
GSFC	15.0	12.0	8.4	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC*	'02	3.6	Good
EDC DAAC	'02	2.5	Excellent
LaRC DAAC*	'03	4.2	Good
EDC DAAC	'03	2.6	Excellent

Comments: *It has been reported that the MISR requirement is obsolete, since the entire MISR team from U Az has moved away. So the ratings are now based on the MODIS flow from EDC, and testing from LaRC will be discontinued in the future. The performance from EDC flow is very stable, and rates "Excellent". Performance from GSFC is also steady.

Performance from LDAAC was less noisy – median of peaks and daily medians were about the same, but daily worst improved – increasing [the discontinued] rating from LaRC DAAC to "Good".

3) CA, JPL:

Ratings: GSFC: Continued **Low**
LaRC: ↓ Adequate → **Low**

Teams: MISR, AIRS, TES, MLS, ASTER
Domain: jpl.nasa.gov

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC → MISR	16.3	10.7	1.4	NISN PVC
GSFC DAAC → AIRS	17.7	14.9	4.4	NISN SIP
LaRC DAAC → MISR	14.3	5.1	0.8	NISN SIP
GSFC → MISR	7.2	7.1	5.7	NISN PIP

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'02	11.2	Low
LaRC DAAC	'03	14.3	Low
GSFC DAAC	'02	17.6	Low
GSFC DAAC	'03	6.7 (?)	Good

Comments:. Performance from LaRC via the NISN private ATM VC between LaRC and MISR dropped substantially on 5 October. Performance started improving 23 October, but is still below previous levels. So it is now rated "Low" against the split LaRC FY'02 requirements, and also vs FY'03. Performance between these same nodes via SIP was also affected by this problem, and would be rated the same.

From GSFC to the AIRS SCF at JPL, the route from the GSFC campus switched from SIP to PIP in July, with performance steady at about 7 mbps. So testing to AIRS was moved to GDAAC, which still uses SIP. Performance from the G-DAAC improved a bit in late September, but the daily median is still below the requirement, thus a FY'02 rating of "LOW". For FY '03 the AIRS requirement is shown as stopping, with the rating back to "Good", but this requirements drop seems unlikely to be accurate.

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4) CA, RSS: (Santa Rosa):

Rating: Continued **Excellent**

Teams: AMSR
Domain: remss.com

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
JPL PODAAC	2753	2172	1377	NISN SIP: 2 x T1

Requirements:

Source Node	FY	kbps	Rating
JPL PODAAC	'02	376	Excellent
JPL PODAAC	'03	380	Excellent

Comments: Performance was very stable this month. The median daily worst is well above 3 x the requirement, so rates as Excellent.

5) CA, UCSB :

Rating: Continued **Good**

Teams: MODIS

Domain: s2k.ucsb.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-DAAC	17.7	11.6	9.0	Abilene via NISN / MAX
EDC	18.8	11.6	8.3	Abilene via vBNS+/Chicago
GSFC-DAAC	12.6	8.2	2.1	23 Sept → 15 Oct
EDC	14.6	6.0	2.0	23 Sept → 15 Oct

Requirements:

Source Node	FY	mbps	Rating
GSFC-MODIS	'02	3.6	Good
GSFC-MODIS	'03	4.3	Good

Comments: Performance had been stable from both sources until 22 September (see above), when a strong daily cycle started from both sources (recovered 16 October). The rating is based on data after 15 October, and remains "Good".

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6) CA, UCSD (SIO) :

Ratings: GSFC Continued **Good**

LaRC: Continued **Excellent**

Teams: CERES, ICESAT

Domain: ucsd.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	40.6	27.9	9.4	Abilene via MAX
LaTIS	26.6	22.0	15.5	Abilene via NISN / Chi
GSFC	30.7	3.6	1.5	23 Sept → 24 Oct
LaTIS	24.0	13.0	4.1	23 Sept → 15 Oct

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02, '03	6.2	Good
LaTIS	'02, '03	0.25	Excellent

Comments: Like UCSB, performance had been stable from both sources until 22 September (see UCSB, above), when a strong daily cycle started from both sources. At that time, the drop was worse from GSFC than from LaTIS. From GSFC, the median daily peaks dropped about 30%, but the median and median daily worst dropped over 80%! The rating would have dropped to "Low", but the performance recovered on 25 October October.

Performance from LaTIS did not drop as much, with peaks almost unchanged, the daily median down 40%, and the daily worst down 75%. It also recovered sooner (the same time as UCSB), and came back a bit higher than before the drop.

7) CO, Colo State Univ.:

Rating: Continued **Adequate**

Teams: CERES

Domain: colostate.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	3.1	2.6	1.4	Abilene via NISN / Chicago
GSFC	4.4	4.3	4.1	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'02	1.67	**Adequate**
LaTIS	'03	1.85	**Adequate**

Comments: Performance from LaTIS remain stable but noisy after dropping around 1 July. The daily worst remains below the requirement for both '02 and '03, so is rated "Adequate". Performance from GSFC is very steady, would rate as "Good" for both years. The thruput limitation (about 4.5 mbps) is the CSU 10M Ethernet LAN.

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8) CO, NCAR:

Rating: Continued Adequate

Teams:MOPITT

Domain: scd.ucar.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	27.0	14.1	3.5	Abilene via NISN / Chicago
GSFC	54.1	31.8	16.1	Abilene via MAX
EDC	83.9	72.1	65.2	Abilene via vBNS+ / Chicago

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'02	4.7	**Adequate**
LaRC DAAC	'03	4.8	**Adequate**

Comments: Performance from LaRC DAAC changed several times since dropping drastically on 28 Aug, due to a NISN route change. It improved back to previous levels (typ 20 mbps) on 14 September, but dropped to about 4 mbps from 3-9 October, then recovered to the 14 mbps typical value reported above. This performance is difficult to nail down to a single rating, but the median is almost always above the requirement, while the daily worst is below it, so a rating of "Adequate" results.

Performance from GSFC began a slow descent at the end of September, from about 50 mbps typical, to about 23 at the end of October. It would still be rated "Excellent".

Performance from EDC to NCAR remained excellent and very stable, using multiple TCP streams to mitigate the EDC firewall window size limitation.

9) FL, Univ. of Miami:

Rating: GSFC: ↑ Adequate → **Good**
LaRC: ↑ Good → **Excellent**

Teams: MODIS, MISR
Domain: rsmas.miami.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	70.8	52.3	19.9	Abilene via MAX
GSFC-MODIS	48.4	36.8	21.4	Abilene via NISN / MAX
LaRC DAAC	11.5	7.2	2.6	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02	9.7	**Good**
GSFC	'03	13.3	**Good**
LaRC DAAC	'02	0.6	**Excellent**
LaRC DAAC	'03	0.8	**Excellent**

Comments: Requirements split between LaRC (MISR) and GSFC (MODIS) in March '02. Performance from all sources continues short term variable. Performance from GSFC improved in September with LAN reconfiguration, now direct to MAX from MTVS1 and GDAAC.

Performance from LDAAC via NISN to Abilene is lower than from GSFC, but improved a bit, now rated "Excellent".

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10) MA, Boston Univ:

Rating: Continued **Excellent**

Teams: MODIS, MISR
Domain: bu.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC DAAC	69.3	51.8	24.1	Abilene via vBNS+ / Chicago
GSFC	93.0	82.8	58.3	Abilene via MAX
LaRC DAAC	37.0	27.2	11.0	Abilene via NISN / Chicago

Requirements:

Source Node	FY	mbps	Rating
EDC DAAC	'02	2.0	**Excellent**
EDC DAAC	'03	2.5	**Excellent**
LaRC DAAC	'02, '03	TBD	**N/A**

Comments: Performance developed a daily cycle in on 5 September from both GSFC and EDC via Abilene -- but remained stable from LDAAC! The peaks were about the same as previously, but the medians dropped about 30%, and the daily worst dropped 80% from GSFC and EDC. However, the rating would have continued "Excellent" during this period.

This condition was corrected on 2 October – performance returned to their previous steady values (the values above reflect the performance after 2 October).

11) MA, MIT:

Rating: Continued **Excellent**

Teams: ICESAT

Domain: mit.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	7.0	6.8	5.9	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02, '03	1.7	**Excellent**

Comments: Performance via Abilene has been very stable since testing began in January 2002 . The thruput limit is a 10M Ethernet at MIT.

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12) MD, Univ. of Maryland:

Rating: Continued **Excellent**

Teams: MODIS

Domain: umd.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX	157.8	151.9	129.4	Direct Fiber OC-12 / MAX / SCF
GSFC-MODIS				NISN / MAX / UMIACS
EDC	133.0	123.0	72.4	VBNS+ / Chi / Abilene / MAX / SCF
NSIDC	36.8	13.7	3.5	Abilene / MAX / SCF

Requirements (QA only):

Source Node	FY	mbps	Rating
GSFC DAAC	'02	1.9	**Excellent**
GSFC DAAC	'03	2.5	**Excellent**

Comments: Steady performance from GSFC-MAX. Performance from EDC is now using multiple TCP streams; median in July was only 43 mbps. Performance from NSIDC is generally stable, but median dropped at the end of August due to congestion at NSIDC (students returned). CU Boulder is upgrading its connection to Abilene from OC-3 to OC-12.

UMIACS test node is having not responding properly since 29 August.

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13) MT, Univ of Montana:

Rating: Continued **Excellent**

Teams: MODIS

Domain: ntsg.umt.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EDC DAAC	26.4	19.1	7.0	VBNS+ / Chi / Abilene
GSFC	31.6	26.9	16.1	MAX / Abilene
NSIDC	28.6	15.9	5.1	CU / FRG / Abilene

Requirements:

Source Node	FY	kbps	Rating
EDC DAAC	'02	459	**Excellent**
EDC DAAC	'03	603	**Excellent**

Comments: Testing from EDC was reported incorrectly reported last month – results were not valid due to confusion regarding firewall rules. Testing restarted from EDC on 23 September, results are shown above, rated as "Excellent". Testing from other sources (GSFC, NSIDC) dropped at the beginning of the September as UCB students returned and congested the Abilene connection. Median had been 36 mbps from both sources.

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14) NM, LANL:

Rating: Continued **Excellent**

Teams: MISR

Domain: lanl.gov

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	15.7	14.1	3.8	NISN SIP / MAE-W (Ames) / ESnet
GSFC	16.8	16.7	15.4	MAX / ESnet

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02	616	**Excellent**
LaRC DAAC	'03	755	**Excellent**

Comments: Performance from LaRC generally stable but noisy. Performance from GSFC extremely stable.

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15) NY, SUNY-SB:

Rating: Continued **Excellent**

Teams: CERES, MODIS

Domain: sunysb.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	21.7	16.8	5.7	NISN SIP / MAX / Abilene / NYSERnet
GSFC	28.4	23.0	11.6	MAX / Abilene / NYSERnet

Requirements:

Source Node	FY	kbps	Rating
LaTIS	'02	536	**Excellent**
LaTIS	'03	551	**Excellent**

Comments: Performance from LaTIS improved 10 August, due to use of multiple TCP streams to mitigate LaRC firewall window limitation, and NISN route change to peer with Abilene at MAX instead of Chicago.

Performance from GSFC steady since May. But performance declined a bit on 16 October (median was 28.4 mbps).

16) OH, Ohio State Univ:

Rating: ↓ Excellent → **Good**

Teams: ICESAT

Domain: ohio-state.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	39.9	22.8	9.7	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02, '03	5.4	Good

Comments: Performance dropped dramatically on 11 Sept due to firewall installation at Ohio. Recovered on 24 September, but below previous levels (median was 40 mbps). Rating drops to "Good".

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17) OR, Oregon State Univ:

Rating: Continued **Good**

Teams: CERES, MODIS

Domain: oce.orst.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaTIS	14.2	11.0	6.7	Abilene via NISN / Chicago
JPL	23.0	11.5	5.4	CalREN / Abilene
GSFC	13.6	9.1	3.1	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaTIS	'02	4.4	Good
LaTIS	'03	5.7	Good
GDAAC	'02, '03	0.12	Excellent

Comments: Performance from all sources steady until 30 Sept, when it began a slow decline, with a daily cycle -- from all sources. This is indicative of congestion in the west. (Medians prior to that: LaTIS: 13 mbps, GSFC 14, JPL 25).

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18) PA: Penn State Univ

Rating: Continued **Good**

Teams:MISR

Domain: psu.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	28.8	21.8	5.5	Abilene via NISN / MAX
GSFC	45.7	45.2	41.1	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'02	2.1	Good
LaRC DAAC	'03	2.3	Good

Comments: Performance from LDAAC improved a bit more; rating still "Good". Performance from GSFC has been very stable.

19) TX: Univ. Texas - Austin

Rating: Continued **Excellent**

Teams: ICESAT

Domain: utexas.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	48.7	45.4	34.2	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02, '03	8.8	**Excellent**

Comments: Performance from GSFC via Abilene remains very stable

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20) VA, LaRC - SAGE III MOC:

Rating: Continued **Excellent**

Teams: SAGE III

Domain: larc.nasa.gov

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
GSFC-SAFS	4199	3889	1251	NISN SIP

Requirements:

Source Node	FY	kbps	Rating
GSFC SAFS	'02, '03	200	**Excellent**

Comments: LaRC firewall upgrade in March removed the former daily cycle.

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21) WA, Univ Washington:

Rating: ↓ Good → Adequate

Teams: ICESAT

Domain: washington.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC	28.7	18.9	10.7	Abilene via MAX

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02, '03	10.9	**Adequate**

Comments: Performance started a slow decline around 1 October (see also Oregon State), dropping rating to "Adequate" for October. By the end of the month the thruput was close to a "Low" rating.
In September, the median thruput (daily Best, Median, Worst) was 31, 24, and 16 mbps)

22) WI, Univ. of Wisconsin:

Rating: ↑ Good → **Excellent**

Teams: MODIS

Domain: ssec.wisc.edu

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	74.5	52.9	27.6	MAX / Abilene / Chi / MREN
GSFC-MAX	60.3	47.2	19.2	MAX / Abilene / Chi / MREN
GSFC-NISN	15.8	14.6	8.1	NISN / Chicago / MREN

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02	9.1	**Excellent**
GSFC	'03	12.2	**Good**

Comments: Reconfiguration at GSFC at the end of August now allows MODIS to use Abilene rather than NISN. Performance improved significantly –- median from MODIS in August was 17 mbps. This value is now used for the rating – improves to "Excellent" for FY '02, still "Good" for '03. Thruput steady from GSFC-MAX via Abilene, and via NISN from GSFC-NISN

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23) Brazil, INPE:

Rating: Continued Adequate

Team: HSB

Domain: inpe.br

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
GSFC	1450	680	301	MAX / Abilene / AMPATH / ANSP
GSFC	1063	473	160	NISN / GBLX / ANSP

Requirements: (2 ISTs only)

Source Node	FY	kbps	Rating
GSFC EOC	'02, '03	622	**Adequate**

Comments: Testing via two routes: performance via AMPATH about the same as previously, rated "Adequate" (barely). Performance via commodity path would rate "Low".

24) Canada, Univ of Toronto: Rating: Continued Good

Team: MOPITT Domain: physics.utoronto.ca

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC DAAC	1.43	1.42	0.93	NISN / GSFC / T1
LaRC DAAC	??	??	??	NISN / Chicago / CA*net4
GSFC	1.43	1.42	1.10	NISN / T1
GSFC	25.0	24.2	22.7	MAX / Abilene / Chicago / CA*net4

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02, '03	160	Excellent
GSFC EOC	'02, '03	311	Excellent
Combined	'02, '03	471	Good

Comments: Performance from both LDAAC (Source of QA data) and GSFC (Source for IST) via NISN dedicated T1 is very steady; performance from LaRC has become less erratic this month. Since both flows are combined together on the T1, the performance compared to the combined requirement rates as "Good".

Performance from both LaRC and GSFC via Chicago / CA*net4 / ONet had serious problems for most of August (perhaps during the upgrade to CA*net4 ?). Good performance recovered from GSFC on 19 August, fully back to previous levels -- would be rated "Excellent". However, from LaRC there have been three dominant performance levels since then. For the end of August, a few times in September, and from 5-15 October performance from LDAAC was about 5 mbps median. But from 27 September to 4 October thruput was around 15 mbps. And for the period 16 October through 6 November performance from LDAAC was terrible – usually under 1 mbps. Hopefully this will stabilize soon with good performance.

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25) IT, EC - JRC: Rating: Continued Adequate

Teams: MISR Domain: ceo.sai.jrc.it

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
LaRC DAAC	802	658	133	NISN / UUnet / Milan
GSFC-NISN	824	741	205	NISN / UUnet / Milan

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02	308	Adequate
LaRC DAAC	'03	1923	Low

Comments: Performance has been stable, with the typical noisy performance from LaRC, and lower daily worst value.

Note: It is unlikely that the FY'03 requirement can be met without additional resources.

26) Netherlands, KNMI:

Rating: Continued **Excellent**

Teams: OMI

Domain: nadc.nl

Test Results:

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MAX → OMI PDR Server	3.6	3.6	3.5	MAX / Abilene/ Chi / Surfnet
GSFC-MAX → KNMI Test Node	87.1	86.5	77.4	MAX / Abilene/ Chi / Surfnet
GSFC-NISN → KNMI Test Node	13.1	7.3	3.5	NISN / Chi / Surfnet

Requirements: (IST Only)

Source Node	FY	Mbps	Rating
GSFC	'03	0.311	**Excellent**

Comments: Performance to the OMI PDR server is still limited by the maximum TCP window size on the OMI PDR server. With the new Surfnet connection reducing the RTT from 140 ms to 95, increasing the thruput on the window size (8 KB) limited flow to about 750 kbps per TCP stream (was 500). 5 streams are used to get the performance above. With the low IST only requirement, this still rates as "Excellent"

Performance is very stable to the KMNI Test node -- thruput increased in September from the previous median of 62 mbps due to the Surfnet upgrade of their connection to Chicago to 10 Gbps (!). This is exceptionally good performance for US to Europe! This flow now appears limited by a 100 mbps LAN – probably at KNMI.

However, via NISN to Chicago, performance is much lower. Therefore, it is important that all servers at GSFC which communicate with KNMI have access to MAX.

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27) Russia, CAO (Moscow):

Rating: Continued **Excellent**

Teams: SAGE III

Domain: mipt.ru

Test Results:

Source → Dest	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
CAO → LaRC	158	157	147	MIPT / TCnet / NISN SIP
CAO → LaRC	1133	1040	524	Commodity Internet
LaRC → CAO	145	138	114	NISN SIP / TCnet / MIPT
LaRC → CAO	1224	1066	456	Commodity Internet

Requirements:

Source → Dest	FY	kbps	Rating
CAO → LaRC	'02	26	**Excellent**
LaRC → CAO	'02	26	**Excellent**

Comments: Performance testing running since 1 November, with dual routes. Performance on NISN dedicated circuit to Moscow, then TCnet (NASA Russian ISP) tunnel to CAO ISP (MIPT) is extremely steady in both directions (but with an occasional outage – about 1 day per month – but 5 days in October).

The dual route configuration also allows testing via the commodity internet route. Performance via that route is better but more variable, also would rate Excellent.

28) UK, London: (UCL SCF)

Rating: ↑ Adequate → **Good**

Teams: MODIS, MISR

Domain: ucl.ac.uk

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
LaRC DAAC	2716	2162	1256	NISN / MAX / Abilene / NY / JAnet
GSFC DAAC	5959	5852	4200	MAX / Abilene / NY / JAnet

Requirements

Source Node	FY	kbps	Rating
LaRC DAAC	'02	616	Good
LaRC DAAC	'03	755	Good

Comments: Performance from LDAAC improved, mostly in the daily worst value – was much less noisy. The rating improves to "Good".

Performance from GSFC has been very stable; would rate as "Excellent".

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29) UK, Oxford:

Rating: Continued **Excellent**

Teams: HIRDLS

Domain: ox.ac.uk

Test Results:

Source Node	Medians of daily tests (kbps)			Route
	Best	Median	Worst	
GSFC	5036	3987	3209	MAX / Abilene / NY / JAnet

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03	311	Excellent

Comments: Very steady performance continues. Datasink went down on 16 October (recovered in November).

Test Results to other EOS HIRDLS UK Sites (Requirements TBD):

Source → Dest	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC → RAL	13.1	8.0	2.4	MAX / Abilene / NY / JAnet

Comments: Thruput to RAL is noisy, but remains excellent. Thruput began a decline at the end of October.