

TENET

Tertiary Education Network



ANNUAL REPORT 2003

COVERING THE FINANCIAL YEAR 1 JANUARY - 31 DECEMBER 2003



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FOREWORD BY THE CHAIRPERSON



Stuart J Saunders | Chairperson

This is TENET's third Annual Report. It provides a good account of the value that TENET adds to the higher education and research institutions, both through the HEIST agreement with Telkom and through its other activities.

Internet connectivity of participating institutions grew by some 25% during the year. In the case of the technikons and universities this growth continues to be stimulated by the Internet Access Development Program (IADP). This Program uses donated funds as an incentive to higher education institutions to increase their own Internet access budgets.

A feature of 2003's activities was the re-shaping of the Development of IT Capacity in Higher Education (DITCHE) Program. TENET's Executive Officer: Capacity Development Programs, Duncan Greaves, who was appointed from the beginning of the year, has successfully re-launched DITCHE as a program of training events and support activities designed to foster the development of expertise and good practice within the cadre of IT support staff and practitioners in the technikons and universities.

Funding for the IADP and DITCHE derives mainly from donations made in 2001 by The Andrew W Mellon Foundation and The Atlantic Philanthropies,

as previously reported. We are most grateful to these two donor foundations for those generous donations.

A key process during 2003 was the re-negotiation, for the first time since 2000, of the price structure for Telkom's Internet access services. This was triggered by the cutover in April 2003, from satellite circuits to the SAT-3 submarine cable, for the transport of trans-Atlantic traffic to and from international networks. While the negotiations were not easy, they were conducted in a constructive, businesslike manner. We are grateful to Telkom for offering reduced prices and for guaranteeing them through to end of 2004.

I regard TENET's close involvement in the initiative to create and deploy a South African National Research and Education Network (NREN) as of the greatest importance. This initiative is managed by the Department of Science and Technology (DST), who commissioned TENET to prepare a comprehensive report detailing the background and issues involved in setting up an NREN, and proposing strategies and action plans that the DST might follow. The DST accepted the "NREN Roadmap Report", and presented a copy of it to the EC Commission during the IST2003 event in Milan. TENET's CEO, Dr Duncan Martin, remains closely involved as a member of the DST's NREN team.

TENET's overall accomplishments during the 12-month period are indeed impressive. It is clear that TENET continues to fulfil its promise as an agency that substantially improves Internet access and related institutional capacities for all the institutions that it serves. This is the result of a very high degree of professionalism and hard work by the staff of TENET.

Finally, it is a pleasure to thank the TENET Directors for their willingness to continue serving on TENET's Board and their contributions to the company during the year under review.

Stuart J Saunders | Chairperson

IDENTITY

PURPOSE OF THE COMPANY

The main purpose of the company is to secure, for the benefit of South African universities, technikons and associated research and support institutions, Internet and information technology services, based upon a customer-specific broadband transport network. This involves entering into and managing contracts with service providers and institutional users, carrying out ancillary operational functions in support of service delivery and providing other value-added services as may from time to time be needed in support of the higher educational and research sector in South Africa. In addition, the company receives donations for and on behalf of public higher education institutions.



Tertiary Education Network (TENET) was incorporated as an association under Section 21 of the Companies Act on 22 August 2000. TENET is also registered as a nonprofit organisation in terms of the Nonprofit Organisations Act.

Co Registration number:	2000/020780/08
NPO number:	014-801 NPO
Address:	46 Rouwkoop Road Rondebosch 7700 Rep. South Africa.



Directors of TENET from left: Dr Andrew Kaniki, Yvette Canham, Dr Duncan Martin, Dr Stuart J Saunders, Piyushi Kotecha, Dr Jim Leatt; INSET from left to right: Tom Nygren, Prof B de L Figaji, Hillel Schrock

MEMBERS & DIRECTORS

CHAIRPERSON

Dr Stuart J Saunders was Chairperson of the Company throughout 2003. The Chairperson of the Company chairs general meetings of Members and Board meetings.

MEMBERS

As a Section 21 company, TENET has no shares or shareholders, and its liabilities are limited to specific personal guarantees made by its Members. TENET's articles of association provide for the Committee of Technikon Principals (CTP) and the SA Universities Vice-Chancellors Association (SAUVCA) each to nominate four Members. The people who were Members of TENET during the reporting period are listed in the following table.

Name	Nominated by	Appointment date	Retirement date
Balintulo, Prof M M	CTP	1 Mar 2002	
Bally, R	SAUVCA	1 Mar 2002	
Figaji, Prof B de L	CTP	1 Oct 2002	
Khoapa, Prof B	CTP	26 Jul 2000	31 Dec 2002
Kotecha, Ms P	SAUVCA	26 Jul 2000	
Lenyai, SKG	CTP	13 Mar 2003	
Naicker, P N	SAUVCA	1 Mar 2002	
Snyman, Prof H C	CTP	26 Jul 2000	
Swartz, Prof D	SAUVCA	15 Mar 2001	

DIRECTORS

TENET's articles of association provide that at any time there shall be at least five and at most nine directors. Directors are appointed at AGMs or by co-option to the Board. All directorships expire at the following AGM. The directors who held office during 2003 are listed in the following table.

Name	Appointment date
Canham, Y	1 Jun 2002
Figaji, Prof B de L	1 Oct 2002
Kaniki, Prof AH	1 Jan 2002
Kotecha, Ms P	17 Aug 2000
Leatt, Dr J V (Deputy Chairperson)	17 Aug 2000
Martin, Dr D H	17 Aug 2000
Nygren, T I (USA)	30 Aug 2000
Saunders, Dr S J (Chairperson)	17 Aug 2000
Shrock, H	1 Jan 2002

MEMBERS



Members of TENET from left: Prof H C Snyman, Prof M M Balintulo, R Bally, Dr S J Saunders, P Kotecha, S K G Lenyai; Inset from left: PN Naicker, Prof B de L Figaji, Prof D Swartz

DONORS

TO HIGHER EDUCATION THROUGH TENET

The Directors are grateful to the National Research Foundation for a special donation of R257 802, to be used for the benefit of participating institutions through the DITCHE Program. This donation was made by the NRF from funds available to it following the winding up of the erstwhile UNINET Project.

As was reported in the first annual report, TENET

also manages donations of US \$1 million from The Andrew W Mellon Foundation and €1.2 million from The Atlantic Philanthropies, both made during 2001, for the purposes of purchasing additional Internet access bandwidth for the institutions and for building greater capacity in the previously disadvantaged institutions to develop and operate their campus networks. Reports on these activities are included below.



ADVISORY COMMITTEE

ADVISORY COMMITTEE

As reported below, the Board appointed an Advisory Committee to advise and assist the CEO and the Board of TENET in assessing connectivity needs of the institutions; improving TENET's existing services; and conceiving, planning and mounting new services and projects.

The names of those that served on the Advisory Committee during 2003 are given in the following table.

Name
Yvette Canham (Chairperson)
Franz Dullaart
Duncan Greaves
Rosalind Hattingh
Chris Johl
Duncan Martin
Vic Stipinovich
Julian Thompson



Members of Advisory Committee front row, from left: Julian Thompson, Yvette Canham, Duncan Martin. Back row from left: Franz Dullaart, Chris Johl, Rosalind Hattingh, Vic Stipinovich, Duncan Greaves

INSTITUTIONS

FOR WHICH TENET ACTS AS AGENT

The following table lists the institutions for which TENET acts as agent in terms of an agency agreement, as at 31 December 2003. The names used are those which applied on that date – some names have since changed as a result of mergers. The number of campuses with HEIST connections is shown in brackets after the institution's name. A "\$" symbol after the name means that the Institution participated in the IADP Program.

Border Technikon \$	SABINET
Cape Higher Education Consortium	Technikon Free State \$ (4)
Cape Technikon \$	Technikon Northern Gauteng \$
Council on Higher Education	Technikon North-West
Durban Institute of Technology \$ (3)	Technikon Pretoria \$ (11)
Eastern Cape Technikon \$	Technikon South Africa
Eastern Seaboard Association of Tertiary Institutions	Technikon Witwatersrand \$ (4)
Fort Cox College of Agriculture and Forestry	University of Cape Town \$
Hartebeesthoek Radio Astronomy Observatory	University of Durban-Westville \$
Human Sciences Research Council	University of Fort Hare \$ (2)
iThemba Laboratory for Accelerator-Based Sciences	University of Natal \$ (3)
Iziko Museums of Cape Town	University of Port Elizabeth \$
Mangosuthu Technikon	University of Pretoria (3)
Medical Research Council (3)	University of South Africa
Medical University of South Africa	University of Stellenbosch (2)
National Botanical Institute	University of Swaziland
National Library of South Africa (2)	University of the Free State \$ (2)
National Research Foundation (2)	University of the North \$
National University of Lesotho	University of the North-West \$
Peninsula Technikon \$	University of the Western Cape \$
Port Elizabeth Technikon \$	University of the Witwatersrand \$
Potchefstroom University for CHE \$	University of Transkei
Rand Afrikaans University	University of Venda \$
Rhodes University \$	University of Zululand \$ (2)
SA Agency for Science and Technology Advancement	Vaal Triangle Technikon \$
SA Astronomical Observatory	Vista University

CEO'S REVIEW OF OPERATIONS

EXECUTIVE SUMMARY

During 2003, the use of Internet access services under the HEIST agreement with Telkom continued its pattern of strong growth in terms of connection bandwidth. This growth continues to be stimulated by TENET's donor-funded Internet Access Development Program (IADP), but is also due simply to institutions' having to cope with rising demand from staff and students. The year also saw the conclusion of the long negotiations with Telkom over inter-campus connectivity services.

It was a pleasure to see TENET's newly appointed Executive Officer: Capacity Development Programs, Duncan Greaves, re-establish the DITCHE Program as a vibrant developmental force in the lives of the IT departments of TENET institutions.

Two major business events occurred in 2003, the third year of TENET's existence. The first was the dramatic advent of the SAT-3 submarine cable as part of the HEIST architecture and the extensive renegotiation of the HEIST price structure that this triggered.

The second was TENET's being contracted by the Department of Science and Technology to prepare a Roadmap for the creation and deployment of a National Research and Education Network, and TENET's subsequent participation in a ministerial delegation to the IST2003 conference in Milan, where the envisaged NREN was discussed with the European Commission.

A third major event – a strikingly successful test of transparent caching of web requests at the international gateway – took place in early 2004, although the preparations for it were done in 2003.

These and other matters are described more fully in this review.

CONTRACTUAL FRAMEWORK

The HEIST agreement

TENET's principal function is to act as the agent of



Duncan H Martin | Chief Executive Officer

each of over fifty higher educational and associated institutions as customers for Internet access services from Telkom SA Limited.

Telkom provides Internet access services to participating institutions in terms of a service agreement between Telkom and TENET that is known as the Higher Education Inter-networking Solution with Telkom, or "the HEIST agreement". This agreement was signed in December 2000 and specifies the services, service levels and price structures. TENET's Annual report for 2002 contained a description of the HEIST agreement.

Participating institutions

Throughout this review I refer to institutions that have appointed TENET as their agent for the procurement of Internet access under the HEIST agreement as "participating institutions". On 31 December 2003, some 82 campuses, including satellite campuses, of 52 institutions were connected to the Internet in this manner. A table listing these institutions appears earlier in this report.

The Minister of Education has mandated a number of mergers between universities and

technikons. While these mergers will, of course, reduce the number of institutions, they are not expected to reduce the number of campuses nor to reduce the demand for Internet access.

In this report, institutions are identified by the names that were in use during 2003.

The agency model

In its role as the appointed agent of each participating institution, TENET handles all interfaces and communications with Telkom on behalf of the institutions, with the exception of operational fault reporting and handling. TENET informs and advises the institutions about services and prices, receives order instructions from institutions, places the orders on Telkom, manages Telkom's performance throughout the installation process, advises the institution when it should test the installation, and then agrees the acceptance date with the institution and informs Telkom.

TENET also handles all administrative processes with Telkom on behalf of the institutions, including sending detailed monthly statements to each institution in which the charges that are due to Telkom and the agency fees that are due to TENET are set out, receiving payments of both kinds from the institutions, receiving and reconciling Telkom's invoices with the order book and, finally, making payments to Telkom on behalf of the institutions.

TENET has built and uses a comprehensive database and information system to enable and support these administrative processes.

TENET covers its operational costs through an agency fee that is charged monthly to participating institutions. TENET's Board sets the agency fee from time to time as a percentage of Telkom's service charges. Initially set at 14%, the agency fee was reduced to 11% of the HEIST service charges from 1 March 2002; to 9% from 1 March 2003 and to 8% from 1 March 2004.



Participants at the IT Directors Forum 3-4 May 2004, Bloemfontein

THE HEIST INTERNET ACCESS SERVICE

In general, HEIST institutions enjoyed effective Internet access services from Telkom during 2003. The year saw the HEIST finally abandon satellite circuits in favour of the new SAT-3 submarine cable. As explained below, this triggered an unfortunate bandwidth crisis and the first re-negotiation of the HEIST price structure. Also for some weeks in the second half-year international connectivity was subject to some instability. However these problems were overcome, and overall, the service from Telkom has been very satisfactory.

Growth in bandwidth order quantities and traffic flows

The commissioned HEIST service capacity continued to grow steadily throughout 2003, as did the volumes of data traffic entering and

leaving the campus networks of participating institutions. The total value of charges invoiced by Telkom for HEIST services grew from R28,208,868 in 2002 to R37,312,345 in 2003 – a growth rate of 32%.

A characteristic feature of Internet use by education and research institutions in countries that are remote from the USA and Europe is the proportion of traffic that flows into their networks from foreign sources.

Totaled across all participating institutions, three times as much data comes from overseas sources as comes from South African ones.

Traffic between participating institutions is comparatively very little. When this effect is coupled to the fact that international bandwidth costs three times as much as local bandwidth, it is not surprising that some 80% of the cost to institutions is associated with the International service.



At IT Directors Forum from left: Clemence Smith, Allan Brinckmann, Paul Tennant

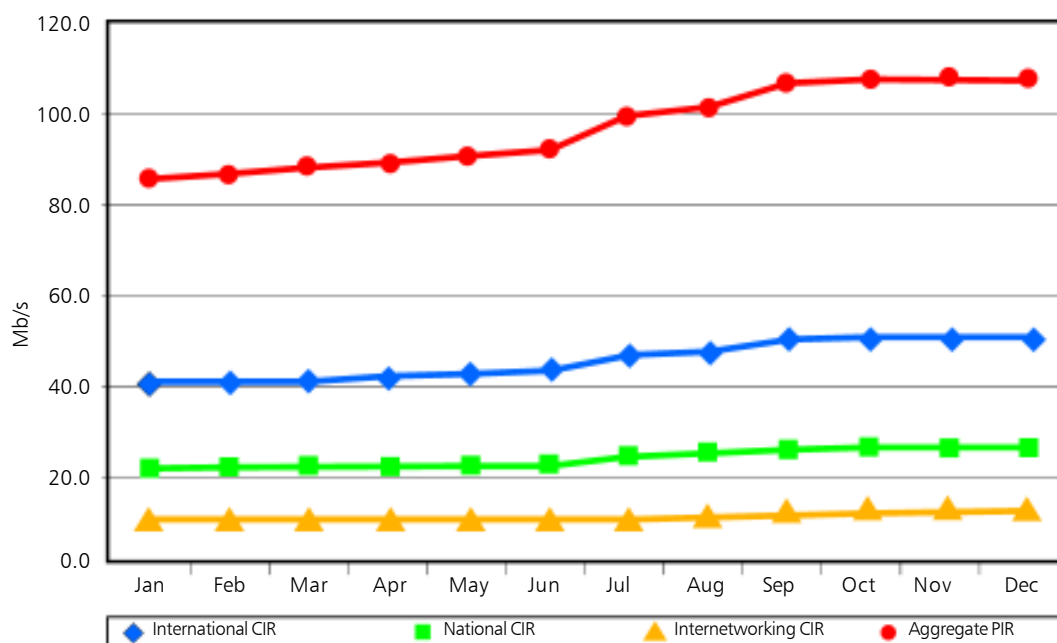


At IT Directors Forum from left: Wilhelm van Belkum, Johann Kistner, Joe Smit, Jakkie Pretorius

The following table shows the charge breakdown by service, totalled across all sites, for 2002 and 2003.

Total HEIST charges (excl VAT) during 2002 and 2003							
	International		National		Within TENET		Total
	Rand	%	Rand	%	Rand	%	
2003	30,266,784	81.1%	4,941,920	13.2%	2,103,641	5.6%	37,312,345
2002	22,352,651	79.2%	3,995,852	14.2%	1,860,365	6.6%	28,208,868

The chart below shows the GROWTH DURING 2003 IN THE AGGREGATE BANDWIDTHS ordered by the institutions.



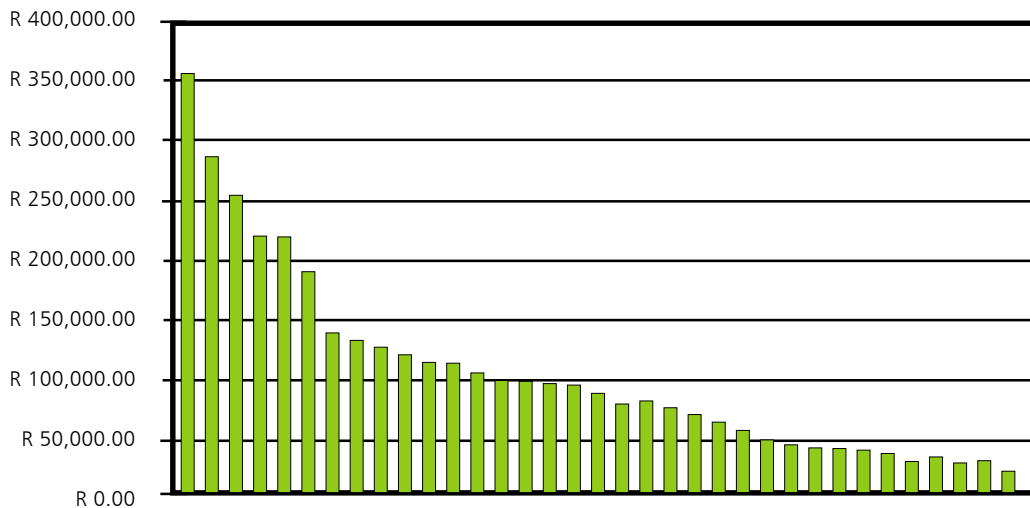
The top graph shows the aggregate Peak Information Rate (PIR), which is the sum of the bandwidths of the physical connections of the sites to the HEIST network. Total Internet access bandwidth grew from 85 Mb/s to 107 Mb/s. While this total makes TENET one of Telkom's largest corporate customers, it is, as the aggregate Internet access bandwidth for some 80 higher education and research campuses, very tiny indeed compared to access bandwidths enjoyed by higher education institutions in Europe and North America.

The lower three graphs in the above chart show the aggregate Committed Information rates (CIRs) for

the International, National and Internetworking (i.e. between TENET sites) connectivity. All three grew during the year, with International CIR growing from 40 Mb/s to 50.4 Mb/s.

The growth in bandwidth order quantities reported here was realised through orders for new or upgraded services to no fewer than 68 sites during 2003. TENET is grateful for the excellent service delivered by Telkom's Service Manager, Ernst Visagie, and his team members who carry out the installation and configuration work entailed in commissioning these orders.

Charges for HEIST services during December 2003 to technikons and universities



Bandwidth distribution among participating institutions

While the 35 participating South African technikons and universities comprise only two thirds of the participating institutions, they use no less than 92% of the total HEIST service capacity.

Within the group of 35 South African technikons and universities there are still large differences in the amount of HEIST services that they use. Each bar on the chart above represents one of these institutions, and the height of the bar represents the charge to the institution for HEIST services during December 2003.

The six tallest bars are the Universities of Cape Town, Witwatersrand, Natal, Stellenbosch, Pretoria and RAU, in that order. The eight tallest bars together account for more than 53% of the total charges. The median charge is R 67,469 per month – up from R 51,750 in 2002.

The pattern reflected in the above chart shows that notwithstanding the Internet Access Development program (IADP), which is reported upon below, very great differences continue to exist between the Internet access capacities of the universities and technikons.

Advent of SAT-3 submarine cable and price negotiations

Advent of SAT-3

The new SAT-3 submarine cable that connects South Africa and a number of West African countries to Europe via its landing point in Lisbon was commissioned late in 2002 and brought into use by Telkom for international traffic to and from the HEIST network on 24 April 2003.

Prior to the cutover, Telkom had been making approximately 18 Mb/s of spare inbound bandwidth on its so-called “Duplex” satellite circuit available to the HEIST during daytime, free of charge. This capacity was in addition to the 45 Mb/s of inbound bandwidth on the “Simplex” circuit that was dedicated to the HEIST. At the time of the cutover, Telkom ignored the free additional bandwidth and provided only 45 Mb/s on SAT-3 for the HEIST. After a few anxious days of seriously reduced and congested service, Telkom agreed to increase the capacity up to 64 Mb/s, at no additional cost to the Institutions, on the understanding that this would be done only for a limited period while Telkom and TENET negotiated a new price structure for the HEIST services. The

negotiations were complex and full agreement was reached only in mid-August and implemented from 25 August 2003.

A key aspect of the negotiation was Telkom's insistence that on SAT-3, unlike on satellite circuits that had been used previously, there was no "spare capacity" that could be made available free of charge. Telkom offered a significant reduction in the unit price of trans-Atlantic bandwidth, on the understanding that at least 70 Mb/s would be ordered and paid for.

This necessitated the introduction of a new parameter, dubbed the International Bandwidth Factor, which determines the amount of trans-Atlantic bandwidth that Telkom must provide per Mb/s of international CIR ordered by any HEIST site. In this regard, it is important to note that there is no reservation of bandwidth per HEIST site on the trans-Atlantic segment – the bandwidth is a shared resource. This model permits traffic to any site to make use of whatever bandwidth is available and so promotes more efficient use of the (very expensive) resource.

The International Bandwidth Factor was initially set at 1.45. TENET is entitled to reset it from time to time.

Telkom also offered a reduction of almost 25% in the unit price of bandwidth on the circuits within South Africa that connect HEIST sites to the international gateway in Bellville and to each other.

The net result of the lower unit prices but having to pay for all trans-Atlantic bandwidth was an increase of approximately 15.5% in the cost of international connectivity to the institutions.

A further aspect was that initially, Telkom wanted to quote the price of trans-Atlantic bandwidth in US dollars, but eventually agreed to quote a price in rand and to guarantee that price until 31 December 2004. The term of the agreement was also extended to 31 December 2004. As was previously the case, Telkom will enjoy preferred supplier status until 16 August 2006.

It is a pleasure to acknowledge the incisive and constructive roles played in the negotiation by two Telkom officers: Mr Godfrey Ntoele, Managing Executive: Business and Government Markets, and Mr Imtiaz Jamal, Executive: Business and Government Markets. In particular, at the height of the negotiation on 30 July 2003, these two gentlemen joined a meeting of the Board at Johannesburg Airport to explain Telkom's value proposition to TENET.

Decision to subvent the increase for the remainder of 2003

An unexpected price increase of over 15% in the middle of a budget year would have been difficult for many institutions to accommodate, especially if they were denied the option of reducing the ordered bandwidth. Noting that the grants that The Andrew W Mellon Foundation and The Atlantic Philanthropies had made to TENET had been made primarily to enable the institutions to acquire more Internet access bandwidth, the Board decided to subvent the cost of the increase in charges for international Internet access until 31 December 2003, and to bear this cost from donor funds still available to TENET. From 1 January 2004 the institutions had to bear the full charge themselves. The total cost of the subvention was R1,701,513.53.



At IT Directors Forum from left: Chris Johl, Chris Nel, Dana Kotze



At IT Directors Forum from left: Dieter Orffer, Manie Maree, George Wolhuter

Effect on network latency

The advent of SAT-3 reduced the average latency on overseas connections to around 250 ms from values between 500 ms and 600 ms that had prevailed while space segments across the Atlantic from major Internet peering points in New York were in use.

IMPROVEMENTS TO THE HEIST *Transparent caching of web requests*

During the second half of 2003, TENET and Telkom reached agreement in principle that a test should be conducted to determine whether transparent caching of web requests at the international gateway would generate a reduction in inbound trans-Atlantic traffic sufficient to justify the cost of purchasing and operating a cache appliance. Telkom very generously agreed to provide a cache appliance for the test, free of charge to TENET. TENET's Board approved such a purchase using TENET's own funds, provided that the test showed there would be a sufficient benefit to the institutions.

One reason why transparent caching at the central HEIST level may not generate adequate

bandwidth savings is that all of the large HEIST sites run site caches, which means that the major benefit of caching has already been taken at the site level. However, a central cache would operate over some 82 sites, many of which do not operate site caches, and so there may well be a worthwhile benefit.

Before the test could be conducted it was essential to compile a list of web sites that should not be requested via the cache. Such web sites include many on-line journals, because such sites grant or deny access to customers according to the source IP address of the request, and would not recognise requests from a cache appliance. TENET is most grateful to Ms Susan Veldsman, of the SA Site Licensing Initiative (SASLI), who produced the first version of the "cache bypass list" for use during the test. TENET's Executive Officer: Systems and Operations, Franz Dullaart, produced a web-based system whereby additions to the list could be requested and rapidly implemented.

The test was originally scheduled for November 2003. However, because by then traffic patterns had already ceased to reflect the normal term-time demand, it was decided to postpone the test until March 2004.



At IT Directors Forum from left: Mickey Moodley, David Ramasodi, Hennie Venter



At IT Directors Forum from left: Tracy Chambers, Julian Thompson, Dianne Amos

The test was an outstanding success, both in its execution and in the unambiguous demonstration it gave that central caching would generate a very significant benefit for the institutions. Consequently the decision in principle has been made to introduce central caching of web requests. Details of implementation are under negotiation with Telkom.

TENET is most grateful to Telkom, and especially to Messrs Christo Knop and Jaco Lesch of SAIX, for the exemplary manner in which they conducted the test, and also to Dr Fred Goldstein and Michael Wood of UCT for their knowledgeable assistance in analysing the log files generated by the test cache.

Spam reduction

TENET has decided in principle that one or more so-called Realtime Blackhole Lists (RBLs) should be applied at the international gateway to reduce the volume of spam traffic that consumes bandwidth on the expensive trans-Atlantic link. This approach prevents any known source of spam (as listed in the RBLs) from exchanging traffic with the HEIST network.

The first RBL – that of Mail Abuse Prevention Systems, a USA company – has been selected and the details of implementation have been agreed with Telkom. The cost, which is not high, will be borne by TENET.

Enabling high-speed downloads of large files

Many research groups in the universities, technikons and research councils need to download large files containing research datasets from foreign sites. This is difficult, mainly because even the largest South African institutions have very limited international connectivity.

With Telkom's active cooperation and assistance, TENET is exploring ways of "soaking up" the 40 – 50 Mb/s of trans-Atlantic bandwidth that is unused during the wee hours of the morning. The idea has two parts:

- (a) to connect a "staging ftp server" directly to the international gateway router. Such a server would have unrestricted access to the shared trans-Atlantic bandwidth, and so would be able to sustain download speeds unrestricted by the PIR of any local access circuit; and
- (b) to permit sites to transfer files from the staging ftp server via their national and/or Internetworking circuits rather than their international ones. By increasing the bandwidth of their national and/or internetworking circuits (which are much cheaper than the international ones), sites would effectively increase their capacity to download large files from foreign sources.



At IT Directors Forum from left: Henry Joubert, Emil Altona



At IT Directors Forum from left: Deon van der Merwe, Vic Stipinovich, Isabel Sanderson, Vic Coetzee, Dirk Weermans

Preliminary tests have shown that the staging ftp server can sustain download speeds of several Mb/s per ftp session.

This work will be continued, and should soon lead to formal proposals to be negotiated with Telkom.

INTER-CAMPUS CONNECTIVITY

The HEIST agreement provides only for Internet access services. However, from the earliest days of the relationship between TENET and Telkom, the need for a further agreement concerning inter-campus connectivity was recognised, as many institutions operate wide area networks (WANs) that interconnect their main and satellite campuses.

After some two years of negotiation, TENET and Telkom signed the Inter-Campus Connectivity (ICC) agreement on 4 April 2003. The ICC agreement provides a framework within which Telkom will provide inter-campus connectivity services to institutions at attractive prices.

For two reasons, it was much more difficult to structure a satisfactory agreement for inter-campus connectivity than it was for Internet access. In the first place, Internet access is not a "basic telecommunications service" and so is not subject to tariff controls in

the way that Telkom's standard point-to-point services are. Secondly, Internet access services are simple to package in standard service and price terms, whereas point-to-point connections can be realised in many different ways, depending on distances and on local conditions and preferences at the end-points.

The structure of the main agreement is such that an institution can request Telkom, through TENET, to undertake an analysis of its wide area networking needs and then to make a comprehensive service proposal. Only if and when the institution accepts the proposal does it commit itself to the terms of the agreement, which include a commitment to Telkom as sole supplier of such services for the duration of the ICC agreement.

By the end of 2003, 21 institutions had requested Telkom to make proposals in terms of the ICC agreement. Three institutions, viz. UNISA, Cape Technikon and RAU, had placed ICC orders, all involving long-distance links, through TENET. One problem appears to be that Telkom's proposals for links over shorter distance do not offer attention-grabbing price advantages. It is also noticeable that even for line-of-sight links, Telkom's proposals have never included low-cost microwave solutions. This possibility is being discussed with Telkom.

CAPACITY DEVELOPMENT PROGRAMS

Repositioning

Towards the end of 2002, TENET undertook a major repositioning of its DITCHE program (“Developing Information Technology Capacity in Higher Education”) according to three guiding principles: first, that DITCHE should aim to enhance capacity not only in purely technical domains but also in the effective use of technology in teaching, learning and research; second, that DITCHE should be developed into an enduring program; and third, that TENET should take direct responsibility for managing the program. As part of the exercise TENET consolidated the management of DITCHE and the IADP in the hands of a new Executive Officer: Capacity Development

Programs, a post assumed, as previously reported, by Duncan Greaves on 1 January 2003.



Session at the 2003 National Techie Event
10-12 November 2003, Port Elizabeth



At 2003 National Techie Event from left:
Simplice Moutou, Sundaram Chatty, Victor Mothata



Discussing the programme at the 2003 National Techie Event 10-12 November 2003, Port Elizabeth



At 2003 National Techie Event from left:
Bruce Harrison, Richard Stubbs, Farivar Rahimi

The Internet Access Development Program (IADP)

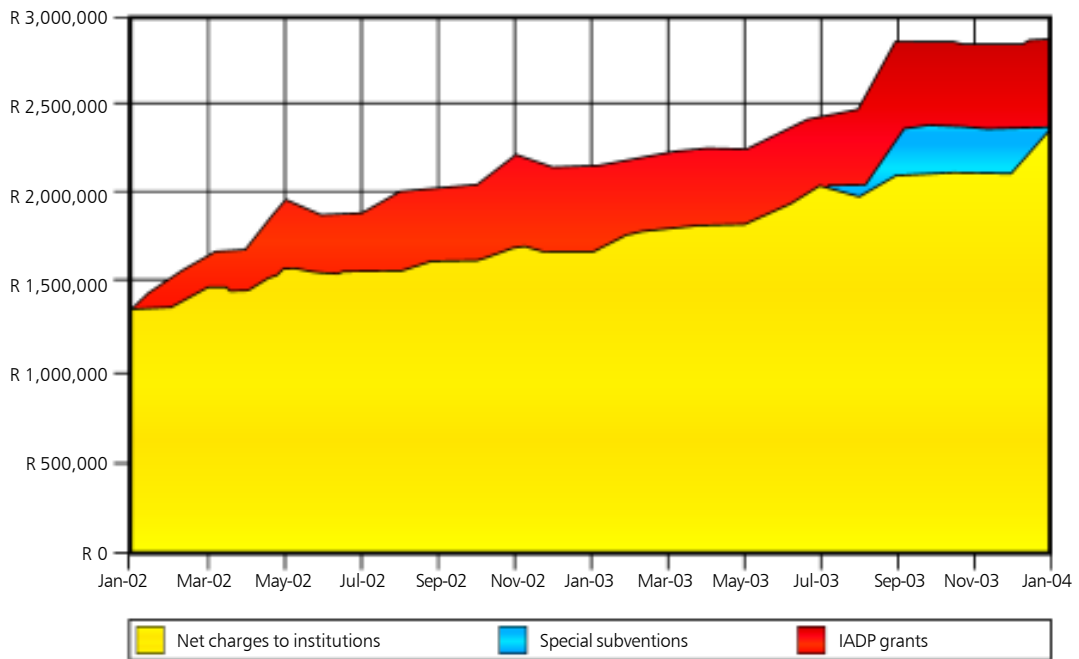
The Internet Access Development Program was designed to assist higher education institutions to grow their Internet access budgets by making grants available for additional bandwidth. Participation was open only to the universities and technikons, and was conditional upon the receiving institution making a contractual commitment to expand its own budget systematically over a period of four years. 25 institutions participate in the program, as reflected in the table which appears earlier in this report.

The IADP aimed to disburse some R12.6 million over the life of the program. Total annual disbursements, from the beginning of the program in February 2002 through to the end of 2003, are showing in the following table.

2003	2002	TOTAL
R 5,216,124	R 3,773,954	R 8,990,078

The total of R 8,990,078 represents 71% of the total earmarked for the IADP program. The bulk of the remaining funds will be disbursed during 2004.

IADP grants and subventions



The effect of this intervention has been a dramatic growth in bandwidth across the great majority of South African institutions of public higher education. The above graph illustrates the extent of this growth. Note that the rand values represented in the graph are aggregates over the 25 universities and technikons that participate in the IADP program. The lower area of the graph represents the net amounts paid by the institutions themselves, while the upper area represents the amounts of the IADP grants. The short, middle area represents the subvention amounts granted to these institutions, as described above.



At IT Directors Forum from left: Farivar Rahimi, Dale Towert, Ralph Pina, Aldien Oosthuizen, Attie Juyn

The DITCHE Program

From January 2003 DITCHE was reconceptualised as an exercise in the nurturing of communities of practice in three key domains within South African public higher education: IT professionals, scholars and academics committed to using IT for educational and research purposes, and library and affiliated information professionals. DITCHE activities are designed to strengthen such communities at both the technical level and the human internetworking level: there is therefore a strong emphasis on events which bring people together and forge enduring relationships of mutual support, as well as impart direct technical knowledge. A range of supplemental and supportive activities provides access to knowledge resources or problem-solving skills.

DITCHE Events in 2003 included two pilot Advanced Technical Events, aimed at rich and structured knowledge transfer. In such events an acknowledged expert works, over a period of one or more days, with a relatively small group of people in exploring a specific issue. The 2003 events – one on PHP and one on The Fundamentals of Network Switching – were convincingly successful, and future DITCHE annual programs will be built primarily around a calendar of such events.

The 2003 National Techie Event demonstrated again the usefulness of bringing together a large group of technical personnel from all or most institutions. The 2003 National Techie Event was again held in Port Elizabeth, at the P E Technikon Conference Centre. The National Techie Event is concerned less with knowledge transfer than with strengthening the national community of practitioners; the experience of two successive annual events suggests the importance of retaining such national gatherings as one of the few means by which the technical community can interact.

A special-purpose event was staged in October 2003 on the theme of Bandwidth Management Strategies. Over 50 staff representing almost all



At 2003 National Techie Event from left: Abdullah Shariff, Riaz Essay, Hennie Rautenbach, Mike Lawrie

institutions gathered at a venue at the University of Pretoria for a wide-ranging conversation on this issue. Six institutions presented material on their approach to the problem, and subsequent discussion illuminated both the range of technical possibilities, and the widely divergent institutional approaches to bandwidth management.

The Technical Books Project was successfully re-launched, following disappointing uptake in 2002; by the end of 2003 books and related content worth more than R 150,000 had been distributed to institutions. The available content was also expanded through agreements with Cisco Press and Pearson Education, and at the end of 2003 Novell Corporation agreed to make their self-study technical material available through the same program. Successful negotiations with Safari Books – a joint venture of O'Reilly Publishing and Pearson Education – added strongly to the Books Project, by allowing institutions access to an on-line repository of over 1400 key technical texts.

Direct assistance to a number of institutions also took place in 2003 in managing intractable localised problems or in providing access to funding for training initiatives.

TENET is very grateful to the many institutions that gave willingly of their staff time and expertise to make the 2003 DITCHE program a success.

Assistance to the Merger Unit of the Department of Education

At the request of the Merger Unit of the Department of Education, Duncan Greaves participated in an investigation of IT issues that should be addressed in mergers. The investigation was funded and managed by officials of the Finnish Government.

PROPOSED NATIONAL RESEARCH AND EDUCATION NETWORK

As reported in the 2002 Annual Report, national research and education networks (NRENs) exist in many countries, and exchange traffic at gigabit speeds via "interconnect" networks such as the European Commission's Géant network. For some time the European Commission (EC) has been encouraging the Department of Science and Technology (DST) to arrange for a South African NREN to connect to Géant.

TENET's Board believes that a well-configured and well-run South African NREN would provide a huge stimulus to research and the training of researchers in South Africa and strongly endorses the DST's efforts towards establishing and funding of a South African NREN. The Board further believes that TENET has the knowledge and experience to take on the tasks of making the NREN happen in design, business and contractual terms, and subsequently of driving the contractual and administrative relationships with participating institutions and with the telecommunications operators and other suppliers that would operate the NREN. Such roles would be similar to those that it plays vis-à-vis the HEIST and also similar to those played by the company Dante plc on behalf of the EC in the management of Géant.

In July 2003, the DST contracted TENET to develop an NREN Roadmap – a detailed plan for the creation and deployment of a South African NREN. TENET subcontracted the writing of major detailed annexures to consultants, including Prof Derek Keats and Messrs Mike Jensen, Mike Lawrie and Henry Watermeyer. The



At 2003 National Techie Event from left:
Joel Vele, Nkhumbuleni Ratshitanga

DST accepted the final report in August 2003. Subsequently, Dr D H Martin, who was the author of the main report within the NREN Roadmap Report, was invited to join the ministerial delegation to the IST2003 conference in Milan, Italy, where the Hon. B Ngubane, Minister of Science and Technology, presented a copy to European Commissioner Mr Erkki Liikanen.

TENET continues to work with the DST towards the establishment of the envisaged NREN.

ADMINISTRATION OF THE AC.ZA DOMAIN

TENET has administered the AC.ZA domain space since 1 March 2001. It is a moderated domain that is reserved for higher education and associated research and support institutions that are domiciled in South Africa.

During 2003 the total number of active third level domains in AC.ZA increased from 130 to 147. Compared to the hundreds of thousands of third level names in CO.ZA, this is a very tiny number. However, the total number of domain names and host names at all levels in AC.ZA is much larger, and of course, the number of email addresses that end in AC.ZA (in particular, those of staff and students at technikons and universities) is huge!

TENET is grateful to the University of Cape Town for hosting the primary name server for AC.ZA. Although located there, the name server is not connected directed to UCT's campus network, but to a separate LAN operated by TENET and connected directly to the HEIST network. TENET's Franz Dullaart takes care of all name server updates and related operational matters.

IP ADDRESS SPACE ADMINISTRATION Project Curla

TENET's Project CURLA (Clean Up of Reverse Look-ups and ARIN whois) was terminated during 2003, having achieved limited success in its objective of bringing pointer records and the ARIN whois records up to date for the eight so-called UNINET Project IP address blocks. While many records were updated, many others could not be because the required information was not forthcoming from some ISPs and end-user organisations.

IPv6 developments

Very little occurred during 2003 within the IT Departments of institutions in the TENET family as regards serious experimentation or learning about IPv6. In many institutions impending mergers generated much more pressing diversions. There are several research groups in academic departments that are involved with IPv6.

FORMATION OF AN ADVISORY COMMITTEE

The IT Directors of participating institutions are, in the first instance, TENET's customers. In formulating TENET's Memorandum and Articles of Association as a non-profit company, great care was taken not to place these IT Directors in the invidious position of being customers, and at the same time, managers of TENET. For this reason, there is only one IT Director (currently Ms Yvette Canham, of the University of Zululand) on the Board. However, feeling that greater formal inputs from IT Directors was required, the Board created an Advisory Committee chaired by Ms Canham ex officio, and having four further IT Directors as members. Three of these IT Directors are appointed for two-year terms by the meeting of IT Directors of Universities and Technikons, while the fourth is nominated by the CEO from the ranks of the IT Directors of participating institutions other than universities or technikons. The names of the members of

the first Advisory Committee appear elsewhere in this report. The Advisory Committee met twice during 2003. TENET is grateful to Mangosuthu Technikon, Umlazi, for hosting these meetings.

STAFF MATTERS

Ms Mariana Swart was appointed as a part-time Technical Officer from 1 October 2003. She is responsible for technical administration of the AC.ZA and UNINET Project reverse lookup domains, assists Duncan Greaves in the administration of TENET's capacity development programs, and is gradually taking over technical and operational aspects of the ordering, billing and payment processes.

IN CONCLUSION

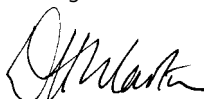
It is a pleasure to thank certain people who have contributed in a sustained way to the activities and results reviewed in this report. The Members and Directors of TENET, and members of the Advisory Committee (names and periods of appointment listed elsewhere in this document) have given freely of their time and wisdom at the AGM and at Board and Advisory Committee meetings.

The Chairman, Dr S J Saunders, and Deputy Chairman, Dr J V Leatt, have participated in Executive Committee meetings and taken special initiatives on several occasions to help TENET to achieve its objectives.

It was a pleasure to work with TENET's officers, Franz Dullaart, Duncan Greaves and Mariana Swart.

TENET values its working relationship with the Cape Higher Education Consortium, with which TENET shares office accommodation and from which TENET buys a bouquet of administrative support services.

Finally, the excellent working relationship between TENET and Telkom is, in great measure, due to the diligence and insight of Telkom's Customer Account Manager, Cornel Bezuidenhout.



Duncan H Martin | Chief Executive Officer
25 April 2004

AUDITED FINANCIAL STATEMENTS

EXTRACT

INCOME STATEMENT			
<i>for the period 1 January 2003 to 31 December 2003</i>			
	<i>Notes</i>	Rand 2003	Rand 2002
Revenue	1	3 007 430	2 901 366
Operating costs		2 589 887	1 651 372
Surplus from operations	2	417 543	1 249 994
Interest received		553 177	403 809
Net surplus for the period		970 720	1 653 803
Accumulated surplus at the beginning		2 681 917	1 028 114
Accumulated surplus at the end of period		3 652 637	2 681 917
BALANCE SHEET			
<i>as at 31 December 2003</i>			
		Rand 2003	Rand 2002
	<i>Notes</i>		
ASSETS		17 144 074	24 363 026
Fixed assets		63 204	77 778
Current assets		17 080 870	24 285 248
Accounts receivable		259 158	100 722
Designated funds at bank	3	9 854 160	15 144 879
Current account	4	6 967 552	9 039 647
EQUITY AND LIABILITIES		17 144 074	24 363 026
Capital and reserves		13 506 797	17 826 796
Designated funds		9 954 160	15 144 879
Accumulated surplus		3 652 637	2 681 917
Current liabilities		3 637 277	6 536 230
Accounts payable	5	3 637 277	6 536 230
CASH FLOW STATEMENT			
<i>for the period 1 January 2003 to 31 December 2003</i>			
		Rand 2003	Rand 2002
	<i>Notes</i>		
Cash inflows from operating activities		(410 174)	7 570 386
Cash generated by operations	6	(963 351)	7 166 577
Interest received		553 177	403 809
Cash flows from investing activities		(35 002)	(41 415)
Proceeds from disposal of fixed assets		-	-
Acquisition of fixed assets		(35 002)	(41 415)
Cash flows from financing activities		(6 917 638)	(4 782 041)
Designated funds drawn down		(6 917 638)	(4 782 041)
Net increase in cash and cash equivalents		(7 362 814)	2 746 831
Cash and cash equivalents at beginning of period		24 184 526	21 437 695
Cash and cash equivalents at end of period	4	16 821 712	24 184 526

NOTES TO FINANCIAL STATEMENTS

for the period 1 January 2003 to 31 December 2003

	Rand 2003	Rand 2002
1 Revenue		
Agency fees	2 866 647	2 897 616
Other income	140 783	3 750
	<u>3 007 430</u>	<u>2 901 366</u>
2 Surplus from operations: takes into account		
Audit fee	-	10 796
Audit fee remuneration for other services	2 200	-
Depreciation of fixed assets	49 576	36 993
Office Rental	51 225	22 493
3 Designated funds These represent donations and interest thereon received for and on behalf of public Higher Education Institutions in South Africa		
Balance brought forward	15 144 879	17 769 886
Less grants drawn down	(6 917 638)	(3 773 954)
Less project amount utilised	-	(1 008 087)
Donations received	-	257 802
Interest received	1 626 919	1 899 232
	<u>9 854 160</u>	<u>15 144 879</u>
4 Cash and cash equivalents		
Net amount held as agent in current account	3 360 768	6 372 544
Balance brought forward on 1 January	6 372 544	2 884 788
Total received from institutions as payment for Telkom's services	35 305 065	28 542 857
Less total paid to Telkom on behalf of institutions	(44 480 179)	(29 674 532)
Plus grants drawn down from designated funds	6 971 638	3 773 954
Plus amounts drawn down to fund DITCHE projects	-	1 008 087
Less DITCHE projects amounts paid over to NRF	(280 093)	(162 610)
Less amount paid to other DITCHE project creditors	(474 207)	-
Own current account	3 606 784	2 667 103
Current account	6 967 552	9 039 647
Designated funds held in bank	9 854 160	15 144 879
	<u>16 821 712</u>	<u>24 184 526</u>
5 Accounts payable		
Included in accounts payable -		
Net amount held as agent in current account	3 360 769	6 372 544
Other creditors	276 508	163 686
	<u>3 637 277</u>	<u>6 536 230</u>
6 Cash generated by operations		
Operating income before interest	417 543	1 249 994
Adjustments for -		
- Depreciation of fixed assets	49 576	36 993
Donations received	-	257 802
Interest received on donations	1 626 919	1 899 232
Operating income before working capital changes	2 094 038	3 444 021
(Increase)/decrease in accounts receivable	(158 436)	156 756
Increase/(decrease) in accounts payable	(2 898 953)	3 565 800
	<u>(963 351)</u>	<u>7 166 577</u>
Contingent liability		
Provision has not been made for SA normal taxation as the company is in the process of applying for income tax exemption in terms of the Income Tax Act for Non-profit organisations. A contingent liability does however exist in the amount of R1 397 098 (2002: R1 226 781), which would be payable if the tax exemption is not obtained. The contingent taxation liability results from interest earned on donor funds and fee income generated.		

OFFICERS

Chief Executive Officer and Public Officer: Duncan H Martin, PhD MBL

Executive Officer: Systems and Operations: J Franz Dullaart.

Executive Officer: Capacity Development Programs (from 1 Jan 2003): Duncan B Greaves.

SERVICE PROVIDERS

Bankers

Commercial:

Standard Bank of South Africa Limited

Investment:

Nedbank Limited

Auditor

KPMG Inc.

Attorney

Richard Rosenthal Attorneys



TENET staff, from left: Duncan Martin, Mariana Swart, Duncan Greaves, Franz Dullaart