

IPv6 efforts in South Africa

French IPv6 Worldwide Summit
Cannes, 14 – 15 November 2006

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Tertiary Education Network

About TENET

- Non-profit, non-governmental, membership-based organisation
 - Controlled jointly by the public universities
- Member institutions:
 - 26 public universities
 - U of Lesotho, U of Swaziland
 - 14 other public research institutions, libraries, support organisations
- Acts as *specialised agent* that procures Internet and other services

The **TENET** network

- 40 institutions; 94 sites
- TELKOM SA Limited is the current provider
 - extensive terrestrial network
 - international connectivity via submarine cable
- Transit connections to:
 - Géant in London
 - Abilene in New York City
- Provides general Internet access
 - Routes announced in Amsterdam, Asburn (VA), London and New York City.
- Performance monitoring and admin

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Some measures

- Bandwidth
 - 262 Mb/s (Aggregate connection b/w across 94 sites)
 - 175 Mb/s (Aggregate bandwidth to Europe and rest of World)
 - 46 Mb/s (Aggregate peering b/w with commodity ISPs in South Africa)
- Costs
 - € 700,000 per month
 - Charges borne by institutions
 - No operational dependence on donations
 - Zero direct subsidy from Government

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What about IPv6 ?

- IPv6 is still not on institutions' to-do lists
 - Efforts to extend the use of IPv4
 - NAT widely used
 - Minimum PI allocation size reduced from /20 to /22 for the African region
-however...

IPv6 activities

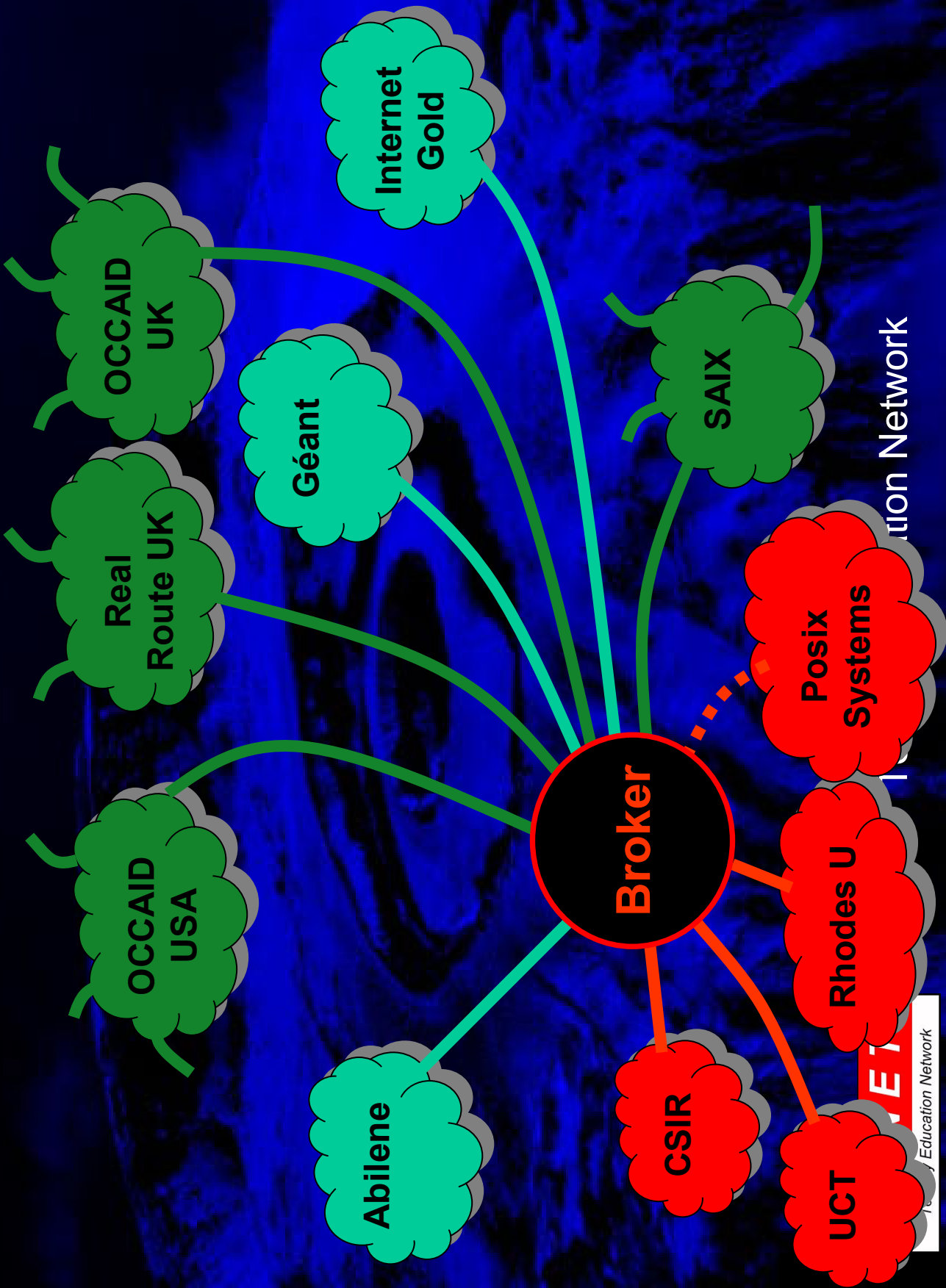
- Experimentation with IPv6 by several university research groups
- TELKOM SA engineers say TELKOM is working towards IPv6-capability
- 6DISS events (so far, one in South Africa)
- IPv6 tunneling infrastructure within TENET network
- Intend to stimulate general interest through re-streaming of video and audio content
 - Will save institutions international bandwidth...
 - available only over ipv6 multicast

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IPv6 tunnels in TENET's network



Education Network

IPv6 address space



- Advent of AfrinIC
- RIR for African and Indian Ocean region
 - HQ in Mauritius; Help Desk in Accra
 - Operations Centre in Johannesburg (Backup Centre in Cairo)
- IPv4 allocations
 - 41.0.0.0 /8 (for new allocations)
 - 196.0.0.0 /8 (historical allocations)
- IPv6 allocation
 - 2001:4200:: /23
- AS allocation
 - 36,864 - 37,887 (for new allocations)

The 5 RIRs

AfrinIC

APNIC

ARIN

LAPNIC

RIPE



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IPv6 prefixes allocations to South African entities

Data from SixXS Ghost Route Hunter, 2006-09-27

Owner	Prefix
TELKOM SA	2001:5280::/32
Internet Solutions	2001:18B0::/32
TENET	2001:4200::/32
TELKOM SA	2001:4208::/32
CMC Networks	2001:4210::/32
UUNET SA	2001:4218::/32
MTNNS	2001:4260::/32
Internet Solutions	2001:4280::/32
ICOZA (Pty) Ltd	2001:4308::/32

Announced

Never seen



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TENET as LIR

- Allocations from AfrINIC:
 - 196.21.0.0/16; 196.24.0.0/16 (IPv4)
 - 2001:4200::/32 (IPv6)
 - Portability of assignments:
 - Assignments to institutions are NOT portable in institution's hands
 - BUT are portable in TENET's hands
- This sustains aggregatability within the TENET network)
- TENET reserves /44 per site; assigns /48

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IPv6 Assignment policies

- 15 geographic sub-regions:
 - /36 aggregations
- One /36 reserved for interfaces
- Institutional assignments:
 - /48s at /44 boundaries

Assignments to institutions

Site	Prefix	Date
Walter Sisulu University, East London	2001:4200:1000::/48	12-02-2004
Rhodes University, Grahamstown	2001:4200:1010::/48	12-02-2004
Free State University, Bloemfontein	2001:4200:5000::/48	13-05-2004
University of Kwa Zulu-Natal, Durban	2001:4200:0800::/48	13-05-2005
University of Cape Town	2001:4200:3000::/48	1-07-2005
TENET Beachhead	2001:4200:FFFE::/47	1-07-2005
Central University of Technology, Bloemfontein	2001:4200:5100::/48	1-07-2005
Nelson Mandela Metropolitan University, Port Elizabeth	2001:4200:2000::/48	13-09-2005
University of the Western Cape, Cape Town	2001:4200:3010::/48	3-10-2005
TENET Head Office	2001:4200:3800::/48	8-11-2005
TENET Beachhead	2001:4200:FFFF0::/48	9-01-2006
Meraka Institute, CSIR, Pretoria	2001:4200:7000::/48	9-01-2006
Posix Systems (ISP)	2001:4200:7E00::/48	2-10-2006

Thanks for listening!



