

SNMP Transition Tool

Management of IPv6 Networks
with IPv4/IPv6 SNMP Gateway

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Introduction

IPv6 is the „next generation” protocol designed by IETF to replace the current IPv4

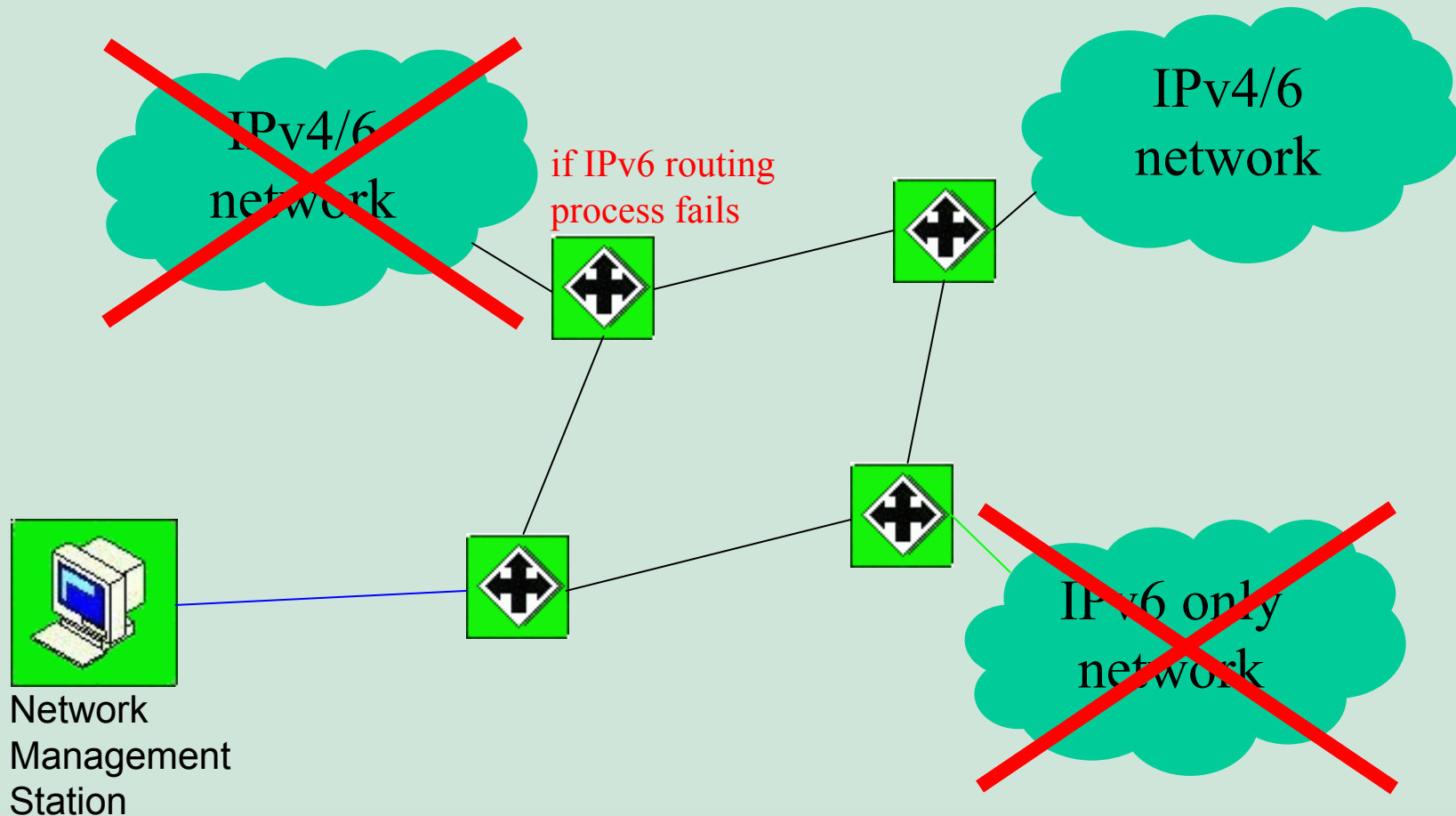
- since January 1995
- more and more popular regular service
- no support for IPv6 in commercial management platforms

No Support for IPv6 in Management Platforms

Management platforms:

- HP OpenView 
- Tivoli NetView 
- Cisco CiscoWorks 
- IPSWITCH WhatsUp 

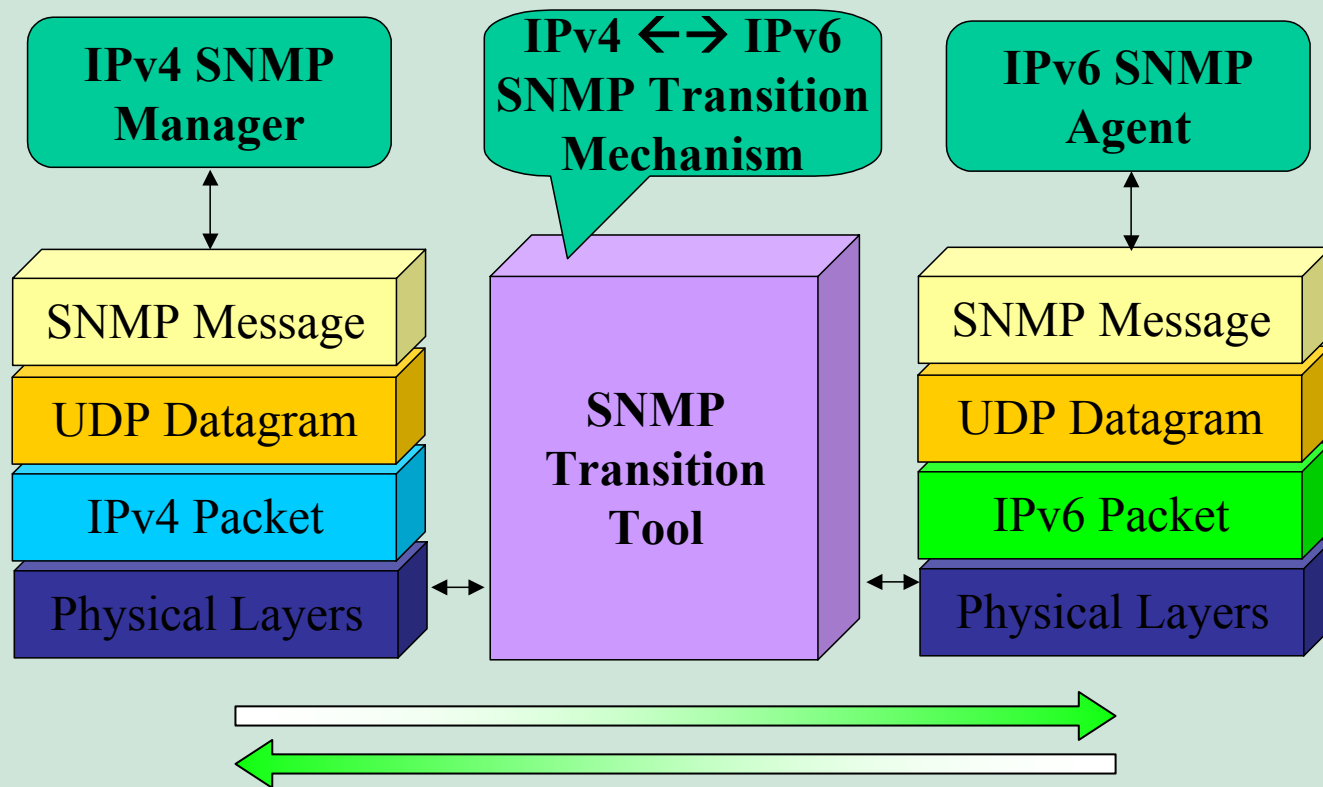
Possible Solution – Dual Stack



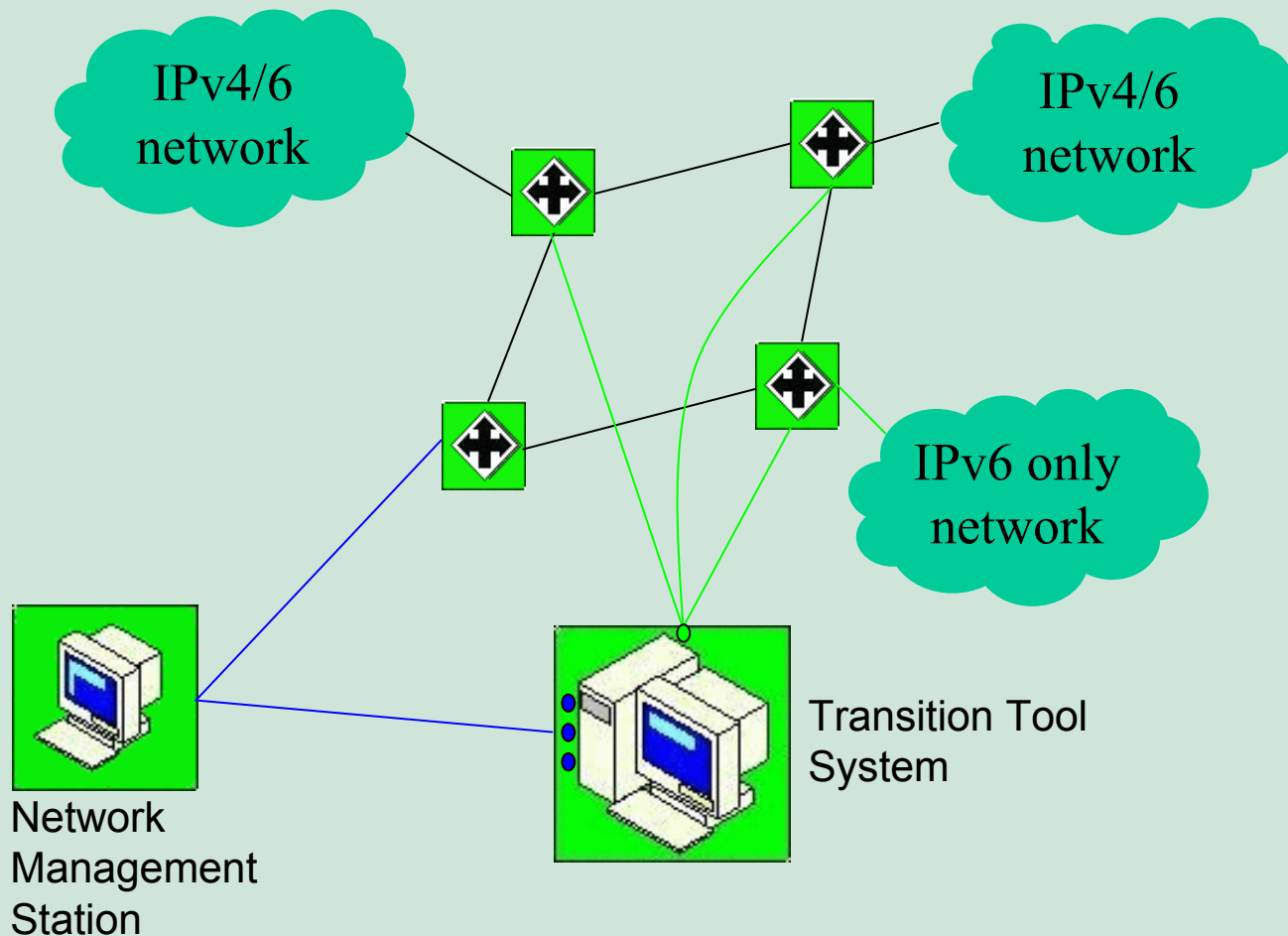
The Idea of SNMP Transition Tool

The main purpose of the development the SNMP Transition Tool is to enable the existing IPv4 network management platforms to monitor and configure the native IPv6 networks. The SNMP Transition Tool will translate SNMP protocol messages between IPv4 and IPv6 networks using its Address Translation Table.

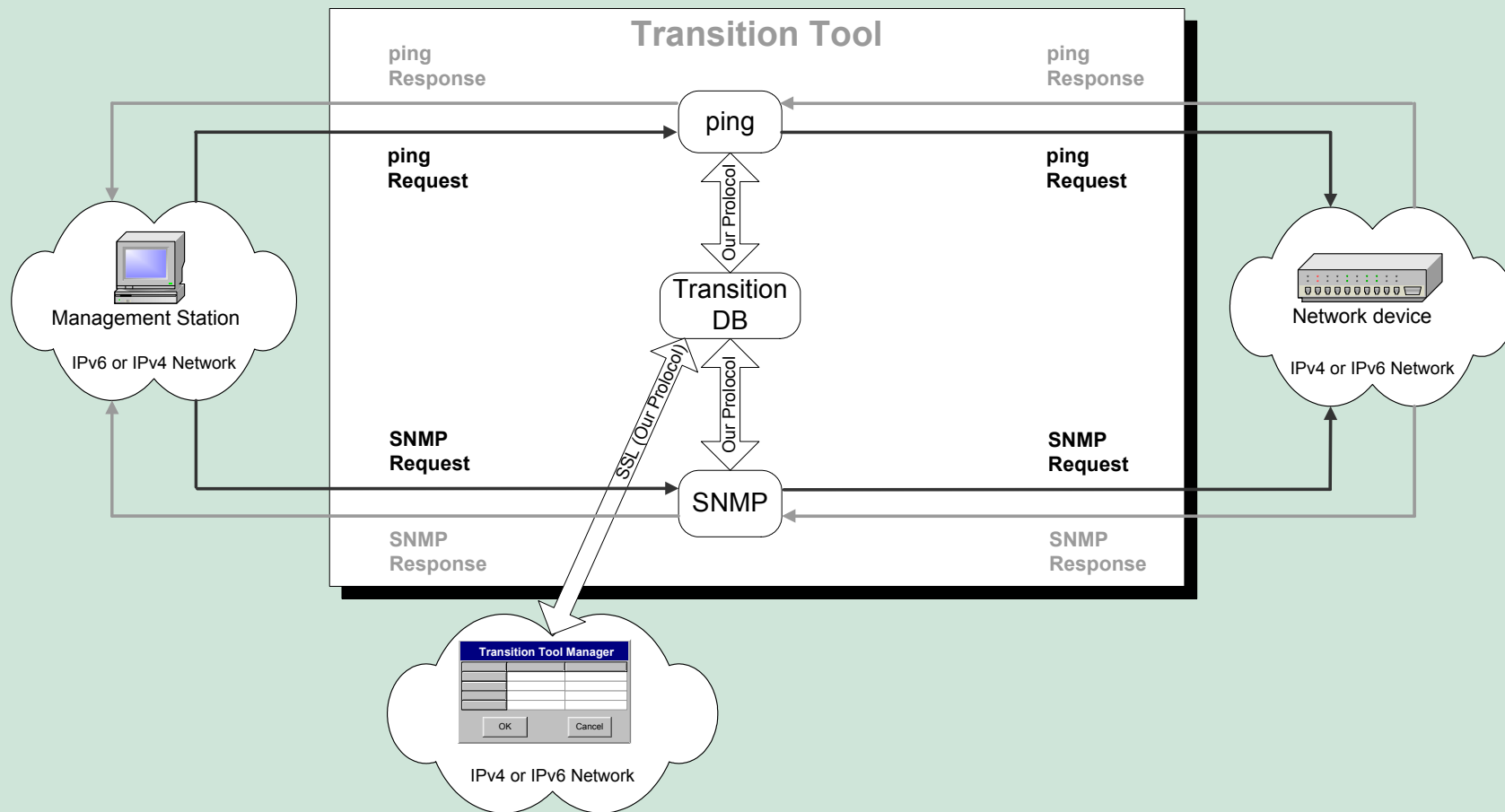
Overview of SNMP Transition Tool



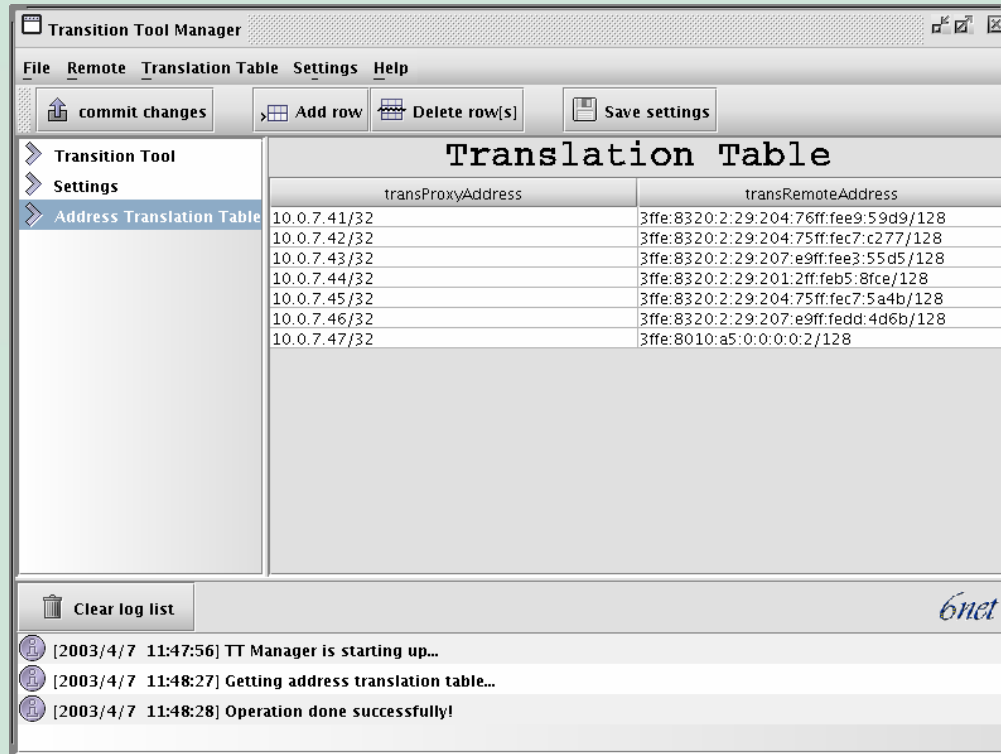
Transition Tool Architecture 1



Transition Tool Architecture 2



Graphical User Interface of Transition Tool



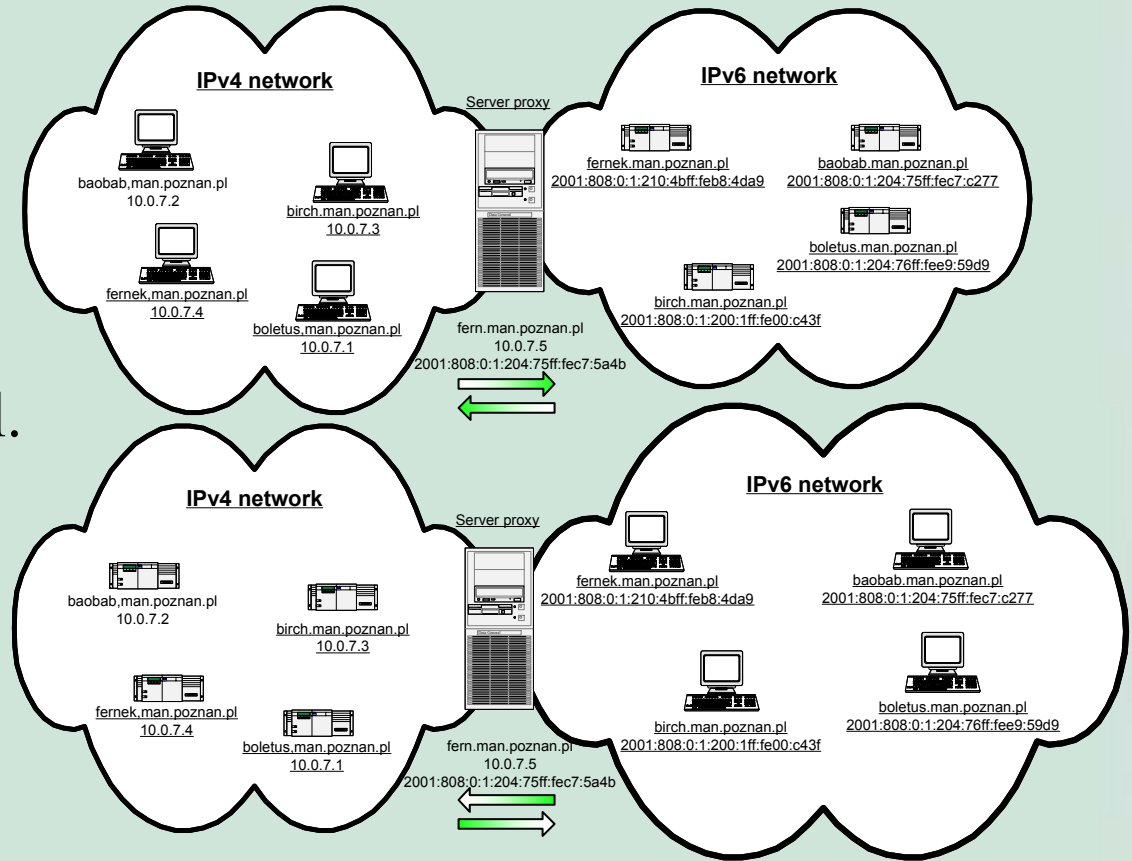
- user friendly
- written in Java 1.4
- secure protocol - SSL
- X.509 PKI

Tests and Results 1

Efficiency

Every station performs a *snmpwalk* towards all agents simultaneously using the Transition Tool.

The Transition Tool translates SNMP packets between IPv4 and IPv6 networks in both directions.



Tests and Results 2

```
birch.man.poznan.pl - PuTTY
[bart@birch bart]$ snmpwalk -c public 10.0.7.14
SNMPv2-MIB::sysDescr.0 = STRING: Linux fernek 2.2.22 #1 Sun Nov 17 10:56:45 UTC
2002 i586
SNMPv2-MIB::sysObjectID.0 = OID: NET-SNMP-MIB::netSnmplibOIDs.10
SNMPv2-MIB::sysUpTime.0 = Timeticks: 0:08:49.49
SNMPv2-MIB::sysContact.0 = STRING: Me <maxiu@fernek.man.poznan.pl>
SNMPv2-MIB::sysName.0 = STRING: fernek
SNMPv2-MIB::sysLocation.0 = STRING: Right here, right now.
SNMPv2-MIB::sysORLastChange.0 = Timeticks: 0:00:00.37
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
SNMPv2-MIB::sysORID.2 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.3 = OID: TCP-MIB::tcpMIB
SNMPv2-MIB::sysORID.4 = OID: IP-MIB::ip
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SNMPv2-MIB::sysORID.8 = OID: SNMP-MPD-MIB::snmpMPDCompliance
SNMPv2-MIB::sysORID.9 = OID: SNMP-USER-BASED-SM-MIB::usmMIBCompliance
SNMPv2-MIB::sysORDescr.1 = STRING: The MIB module to describe generic objects fo
r network interface sub-layers
SNMPv2-MIB::sysORDescr.2 = STRING: The MIB module for SNMPv2 entities
SNMPv2-MIB::sysORDescr.3 = STRING: The MIB module for managing TCP implementatio
ns
```

Tests and Results 2

```
birch.man.poznan.pl - PuTTY
[bart@birch bart]$ snmpwalk -c public 2001:808:0:1:14
SNMPv2-MIB::sysDescr.0 = STRING: Linux fernek 2.2.22 #1 Sun Nov 17 10:56:45 UTC
2002 1586
SNMPv2-MIB::sysObjectID.0 = OID: NET-SNMP-MIB::netSmpAgentOids.10
SNMPv2-MIB::sysUpTime.0 = Timeticks: 0:08:51.31
SNMPv2-MIB::sysContact.0 = STRING: Me <maxiu@fernek.man.poznan.pl>
SNMPv2-MIB::sysName.0 = STRING: fernek
SNMPv2-MIB::sysLocation.0 = STRING: Right here, right now.
SNMPv2-MIB::sysORLastChange.0 = Timeticks: 0:00:01.42
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
SNMPv2-MIB::sysORID.2 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.3 = OID: TCP-MIB::tcpMIB
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ns
```

```
boletus.man.poznan.pl - PuTTY
[idolata@boletus idolata]$ snmpwalk -c public 2001:808:0:1:13
SNMPv2-MIB::sysDescr.0 = STRING: Linux birch 2.2.22 #1 Sun Nov 11 15:23:14 UTC 2
002 1586
SNMPv2-MIB::sysObjectID.0 = OID: NET-SNMP-MIB::netSmpAgentOids.10
SNMPv2-MIB::sysUpTime.0 = Timeticks: 0:08:52.31
SNMPv2-MIB::sysContact.0 = STRING: Me <bart@birch.man.poznan.pl>
SNMPv2-MIB::sysName.0 = STRING: birch
SNMPv2-MIB::sysLocation.0 = STRING: Right here, right now.
SNMPv2-MIB::sysORLastChange.0 = Timeticks: 0:00:02.12
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
SNMPv2-MIB::sysORID.2 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.3 = OID: TCP-MIB::tcpMIB
SNMPv2-MIB::sysORID.4 = OID: IP-MIB::ip
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SNMPv2-MIB::sysUpTime.0 = Timeticks: 0:08:55.12
SNMPv2-MIB::sysContact.0 = STRING: Me <bart@birch.man.poznan.pl>
SNMPv2-MIB::sysName.0 = STRING: birch
SNMPv2-MIB::sysLocation.0 = STRING: Right here, right now.
SNMPv2-MIB::sysORLastChange.0 = Timeticks: 0:00:01.45
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
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```

Tests and Results 3

Browse MIB

Name or address: 10.0.7.14 Community name: public

MIB object ID: .iso.org.dod.internet.mgmt.mib-2

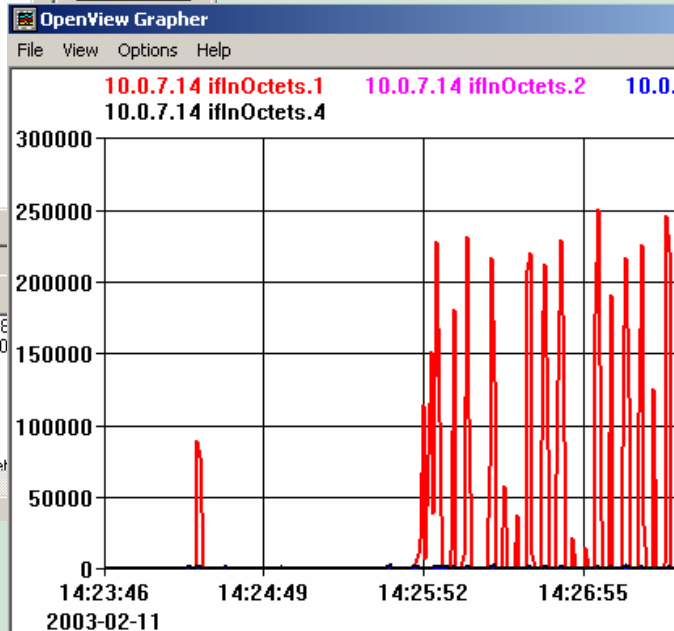
directory
 mgmt
 mib-2
 system

- sysDescr
- sysObjectID
- sysUpTime
- sysContact
- sysName
- sysLocation
- sysServices
- sysORLastChange

MIB instance: SNMP set value:

MIB values:

```
sysDescr.0 : Linux fernek 2.2.22 #1 Sun Nov 17 10:54:06  
sysObjectID.0 : .iso.org.dod.internet.private.enterprises.80  
sysUpTime.0 : (1197919) 3:19:39.19  
sysContact.0 : Me <me@somewhere.org>  
sysName.0 : fernek  
sysLocation.0 : Right here, right now.  
sysORLastChange.0 : (37) 0:00:00.37  
sysORTable.sysORFEntry.sysORID.1 : iso.org.dod.internet
```



MG-SOFT MIB Browser Professional DOCSIS/DH Edition

File Edit View SNMP Action Tools Window Help

Query MIB Ping

Remote SNMP agent: 10.0.7.14

MIB tree

- iso
- org
- dod
- internet
- directory
- mgmt
- mib-2
- system
- sysDescr
- sysObjectID

Query results

Welcome to MG-SOFT MIB Browser Professional DOCSIS/DH Edition

Remote address: 10.0.7.14 port: 161 transport: IP/UDP
Local address: 150.254.170.109 port: 1697 transport: IP/UDP
Protocol version: SNMPv1
Operation: Get

Remote address: 10.0.7.14 port: 161 transport: IP/UDP
Local address: 150.254.170.109 port: 1697 transport: IP/UDP
Protocol version: SNMPv1
Prompt for OID request:
1: sysDescr.0 (null) null

Prompt for OID response binding:
1: sysDescr.0 (octet string) Linux fernek 2.2.22 #1 Sun Nov 17 10:54:08 UTC 2002 #986 [4C.69.6E.75.78.20.66.65.72.6E

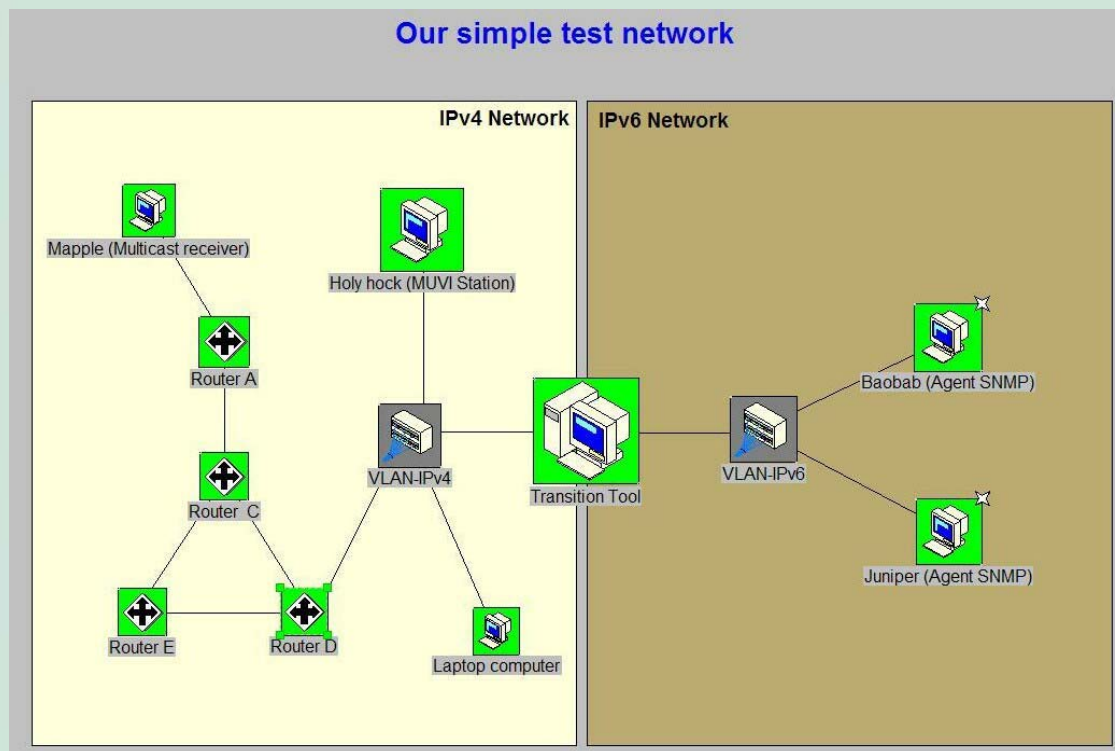
Remote address: 10.0.7.14 port: 161 transport: IP/UDP
Local address: 150.254.170.109 port: 1700 transport: IP/UDP
Protocol version: SNMPv1
Operation: Get

Remote address: 10.0.7.14 port: 161 transport: IP/UDP
Local address: 150.254.170.109 port: 1700 transport: IP/UDP
Protocol version: SNMPv1
Prompt for OID request:
1: sysContact.0 (null) null

Prompt for OID response binding:
1: sysContact.0 (octet string) Me <me@somewhere.org> [4D.65.20.3C.6D.65.40.73.6F.6D.65.77.68.65.72.65.2E.6F.72.6E

OID 1.3.6.1.2.1.1.4 SNMPv1

Implementation



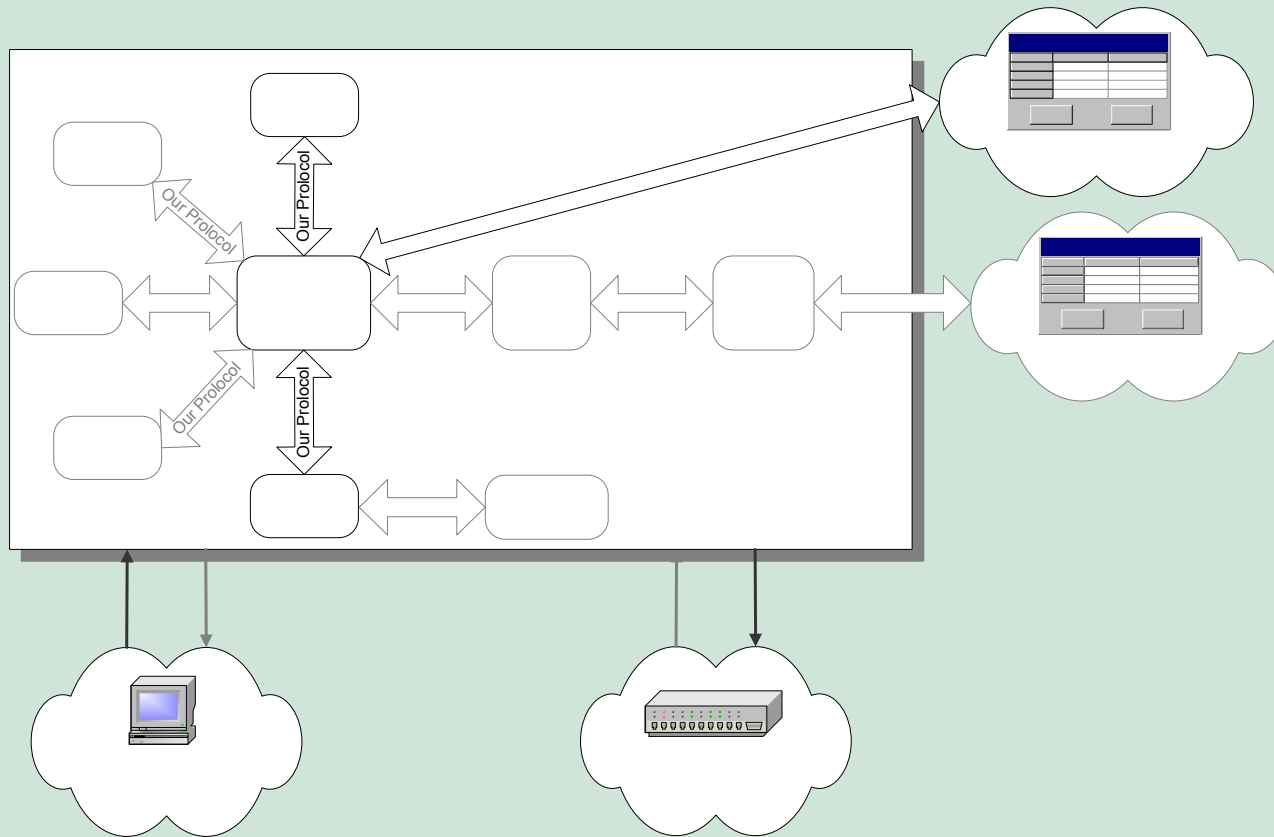
Testbed presented on
TF-NGN, Poznan,
May 2003:

- IPv4 network
- WhatsUp Web interface possible
- SNMP Transition Tool
- IPv6 network

Future Development

- Extend tool with new modules – DNS, 6tunnel, etc
- Trap forwarding
- SubAgent – collaborates with any SNMP agent AgentX protocol compatible
- Automatic address configuration
- MIB conversions – lots of problems to solve, e.g. see RFC 2962 - "An SNMP Application Level Gateway for Payload Address Translation"

Proposition of the New Transition Tool Architecture



How to Get it

<http://www.ipv6.man.poznan.pl>

License Type: GPL

POZNAN SUPERCOMPUTING AND NETWORKING CENTER
IPv6 network

1 → [SNMP Transition Tool](#)

2 ↓ **SNMP Transition Tool Page**

HOME	DOWNLOAD	PROJECT TEAM	LINKS
The SNMP Transition Tool v1.0 release			
	tgz		
Project documentation generated by DOXYGEN			
	html	zip	
The SNMP Transition Tool Specification			
	pdf		
Transition Tool tests report			
	ppt	zip	

Thank you!

Any questions, comments or remarks are very welcome.

Contact: 6net@man.poznan.pl