IPv6 Hands-on session:
Examples of IPv6 Services, Management tools & Applications

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  - **Or helpdesk@6diss.org**

IPv6 & Services

- Goals
  - Support access to services over IPv6
  - Sustain IPv6-related information
- Basic Services
  - Name Service (*DNS*), Web Hosting (*HTTP*), Electronic mail (*SMTP*), File transfer (*FTP*), Dynamic Configuration (*DHCP*), Clock Synchronisation (*NTP*), etc.
- Other Services
  - Databases, directories (e.g. *openLDAP*), instant messaging (e.g. *Jabber*), IRC, file sharing, news, etc.

IPv6DISSemination and Exploitation

Name Service (DNS)

- BIND (www.isc.org/index.pl?/sw/bind)
- Four entries per node are needed in a dual stack network
  - Two forward records under the same label
    - www.grnet.gr   IN A   195.251.25.37
    - www.grnet.gr   IN AAAA 2001:648:2ffc:200::2037
  - One reverse PTR record under in-addr.arpa
  - One reverse PTR record under ip6.arpa
    - 7.3.0.2.…1.0.0.2.ipv6.arpa   IN PTR www.grnet.gr.
- DNS queries are supported over IPv6
  - Not all root servers support it!
  - Broken IPv6 connectivity between host and server may influence the performance.

Web Hosting (HTTP)

- **Servers**
  - Apache2 (native), Apache 1.3 (patched)
  - Internet Information Services (IIS) v4+
  - If upgrade to IPv6-enabled version is not feasible, you may use *reverse HTTP proxy!*
- **Clients**
  - Mozilla, Firefox, Explorer, Opera, Konqueror, Lynx, Safari, etc
- **Proxies**
  - Squid, Ffproxy, etc.

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Other basic services (1/2)

- ## Electronic Mail (SMTP)
  - Multiple servers
    - Sendmail (8.10+), MS Exchange, Qmail (patch), Postfix (patch), Exim
  - Multiple clients
    - Mozilla, Thunderbird, etc.
  - MX records support IPv6 entries
- ## File Transfer (FTP)
  - Multiple servers
    - ProFTPD (www.proftpd.org),
  - Multiple clients
    - Lftp (lftp.yar.ru/), tnftp, cftp, web browsers, etc

Other Basic Services (2/2)

- Dynamic Host Configuration (DHCP)
  - "Stateful" DHCPv6 (RFC 3315)
    - Similar to IPv4 counterpart protocol
    - Advertise more than IP addresses!
  - Stateless DHCPv6 (RFC 3736)
    - Advertise only no-IP related info
    - Combine it with IPv6 Stateless autoconfiguration (RFC2462)

- Network Synchronisation (NTP)
  - IPv6-enabled server & client available (www.ntp.org)
  - Alternative solutions
    - RIPE Test Traffic Measurement
    - Meinberg NTP server (commercial product)

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Management tools

- SNMP and MIBs

- Basic tools

- Tools (protocols & graphs)

- Tools (monitor & measure)

Management tools is a *strict* requirement
for every IPv6/4 network

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SNMP & MIBs

- IPv6-related MIBs
  - Unified IPv4/6 MIBs are standards except BGP4
- SNMP over IPv6
  - SNMP queries over IPv6 are supported from most vendors
- Implementation issues
  - Different levels of support: mixture of *private*, *IPv6-standard MIBs*, *Unified MIBs.*

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Basic tools

- Most commercial routers support IPv6 connections over SSH and TELNET
  - Periodic scripts can retrieve information from the routers over IPv6
- TFTP over IPv6 is also well supported
  - Software images/configuration can be transported over IPv6

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Tools (protocols & graphs)

- ASPath_Tree (carmen.ipv6.tilab.com/ipv6/download.html)
- Looking Glass (w6.loria.fr)
- IPFlow/Netflow
- Mping (mping.uninett.no)
- Cricket (cricket.sourceforge.net)
- MRTG&Weathermap (netmon.grnet.gr/weathermap/)
- RIPE Test Traffic Measurement

ASpath-Tree

- **Displays inter-domain network "topology" by collecting BGP routing table**
- **Automatic generation of HTML pages.**

http://www.join.uni-muenster.de/bgp/bgp.html

IPv6DISSemination and Exploitation
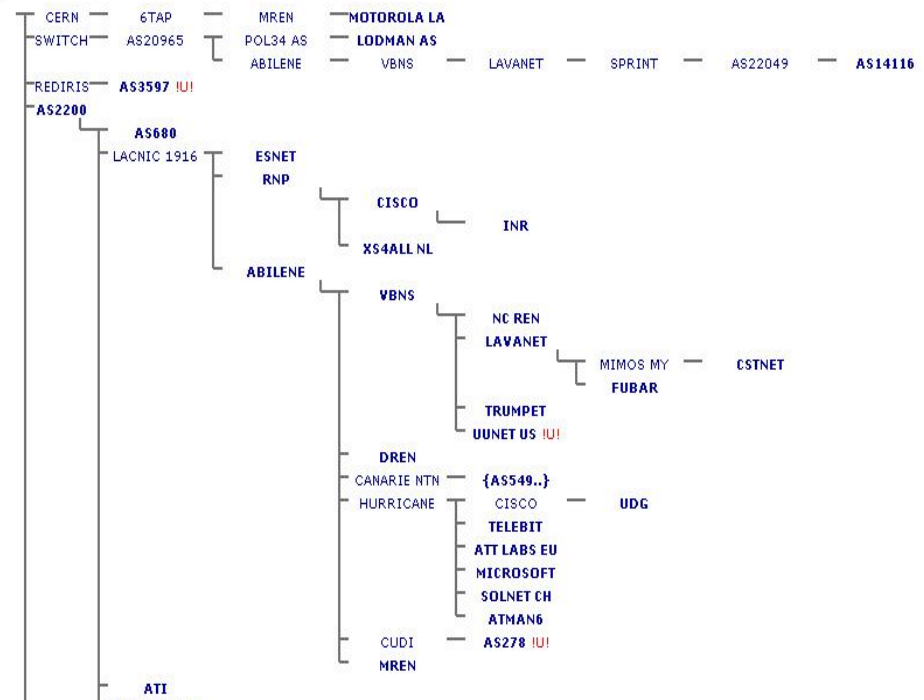
Looking Glass

- **Get information from a router via a Web interface**

- **End user don't need to login to router**

- **Allows the user to detect causes of failures w/o asking the NOCs**

http://netmon.grnet.gr/lg.shtml

Weathermap

- SNMP-based network traffic grapher
- Monitor the link utilisation

http://netmon.grnet.gr/map.shtml
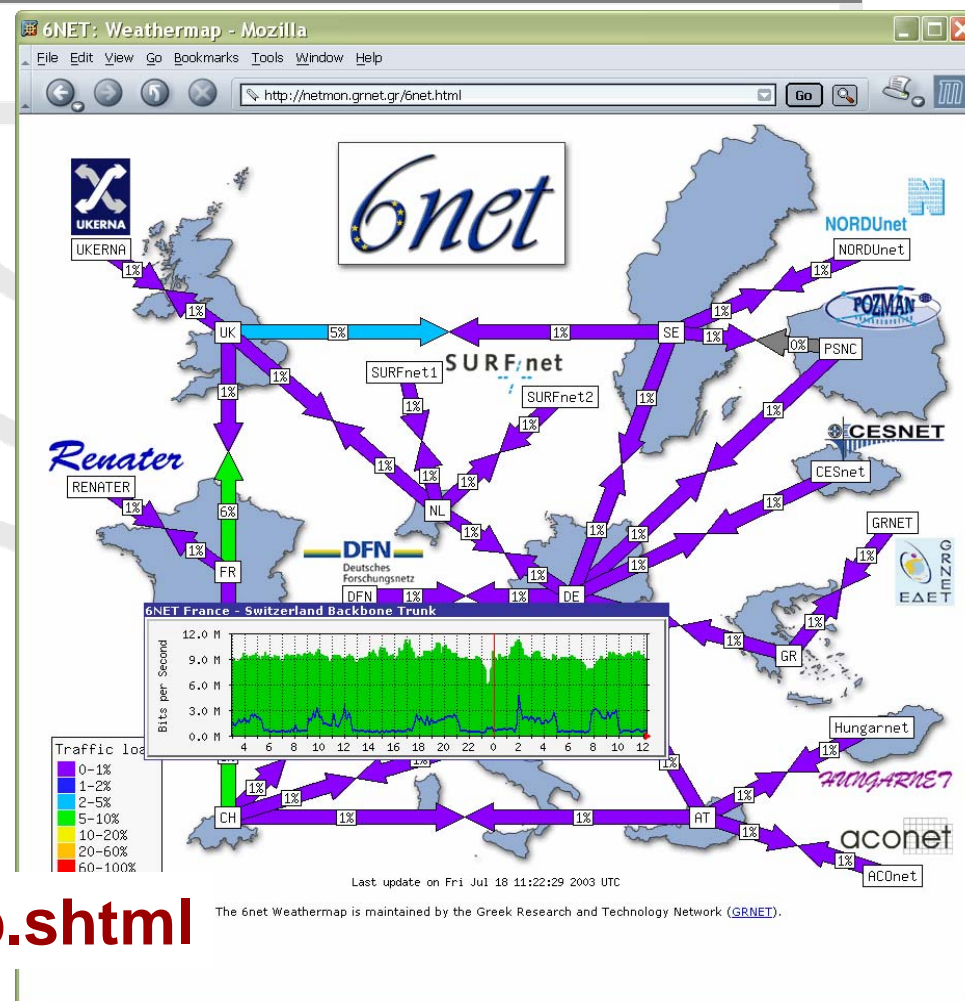
Tools (monitor and measure)

- Argus (argus.tcp4me.com)

- Nagios (www.nagios.org)

- Ethereal (www.ethereal.com)

- Multicast Beacon (dast.nlanr.net/Projects/Beacon)

- iperf (dast.nlanr.net/Projects/Iperf)

- ntop (www.ntop.org)

- Open_Eye/Panoptis (panoptis.sourceforge.net)

Argus

- **Monitor**
  - Network element status, e.g. PCs, switches, routers. etc
  - Node availability
  - Traffic
  - Services, e.g. http, ftp, dns, imap, smtp, etc
- **Easily extendible**

IPv6DISSemination and Exploitation

Nagios

- **Monitor**
  - Services
  - Network
- **Could be a complex tool for a small network**
- **New features can be added with plug-ins, e.g. BGP monitoring**

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Ethereal

- Packet capturing tool
- Useful for connectivity and troubleshooting
- Available for most platforms
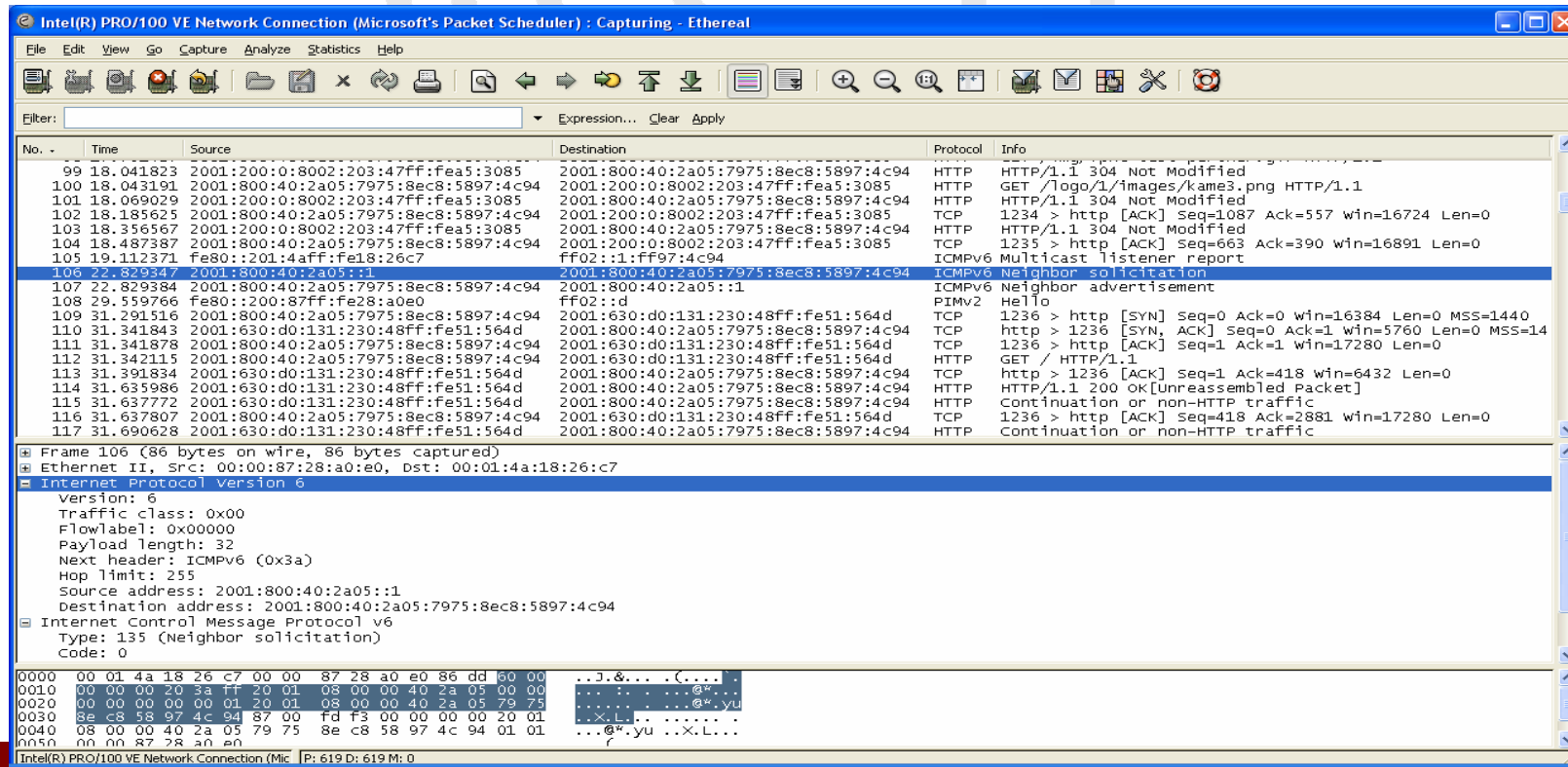
MonitoringToolsList

at Dante

Here is a list of monitoring tools that are currently being evaluated by wp6 members. If you are responsible for evaluating or/and migrating a tool to ipv6, then please make sure that the corresponding page is always updated with the latest information.

If you are evaluating a tool not listed in here, please update this page with a WikiName and then provide a description of the tool.

Any page can be edited by anyone by selecting the EditText link at the bottom of the page.

- Analyzer (AnalyzerTool)
- Argus (ArgusTool)
- AS Path Tree (AsPathTree)
- Cisco Works Campus Manager (CiscoWorksCM)
- Cricket (CricketTool)
- Ethereal (EtherealTool)
- flow-tools (FlowTools)
- HP OpenView Network Node Manager (HPOpenView)
- InfoVista
- IPm (IpmTool)
- IPv6 Management Gateway (Ipv6Mg)
- IRDD Tool Set (IrddToolSet)
- Java SNMP Programming Environments (JavaSnmpProgrammingEnvironments)
- Jnettop (JnetTop)
- JOIN-TV (JoinTv)
- Looking Glass Service (LookingGlassService)
- MERIT's 6bone Routing Report (Merit6BoneRoutingReport)
- Mping (MpingTool)
- MRTGv6 (MrtgV6Tool)
- MTR (MtrTool)
- Multicast Beacon (MulticastBeacon)
- Nagios (NagiosTool)
- NatKit
- NetSNMP (NetSnmp)
- Netflow/IPFIX (NetflowIpFix)
- Netflow: IPv6 Support for Netflow v9 in IOS (NetFlowIos)
- Netflow: UTC collector (NetFlowUtc)
- NMIS: Network Management Information System (NmisTool)
- NTOP (**NtopTool**)
- NTPv4: Meinberg Lantime (NtpMeinberg)
- Open-eye: (OpenEye)
- PCHAR (PcharTool)
- Rancid (RancidTool)
- SNMP Session (SnmpSession)
- SNMP Proxy (SnmpProxy)
- Lan Topology Discovery Service (LanTopologyDiscoveryService)
- Polyphemus (PolyphemusTool)
- Ripe NCC Test Traffic Tools (RipeNccTestTrafficTools)
- Tunnel Trace (TunnelTrace)
- Weathermap (WeathermapTool)

Some IPv6-enabled applications

- **Real-time videoconference and media streaming**
  - GnomeMeeting, Softphone, OpenMCU, VideoLAN, DVTS, MPEG4IP(Darwin Stream Server), VIC/RAT, NTE etc.
- **Directory Services**
  - OpenLDAP, Sun iPlanet
- **On-line games**
  - Quake
- **E-business solutions**
  - WEB Sphere portal

Snapshots of videoconferencing applications
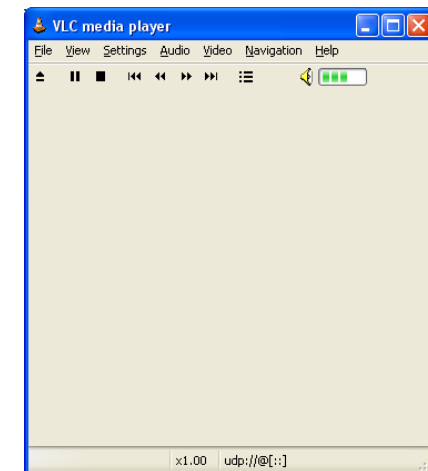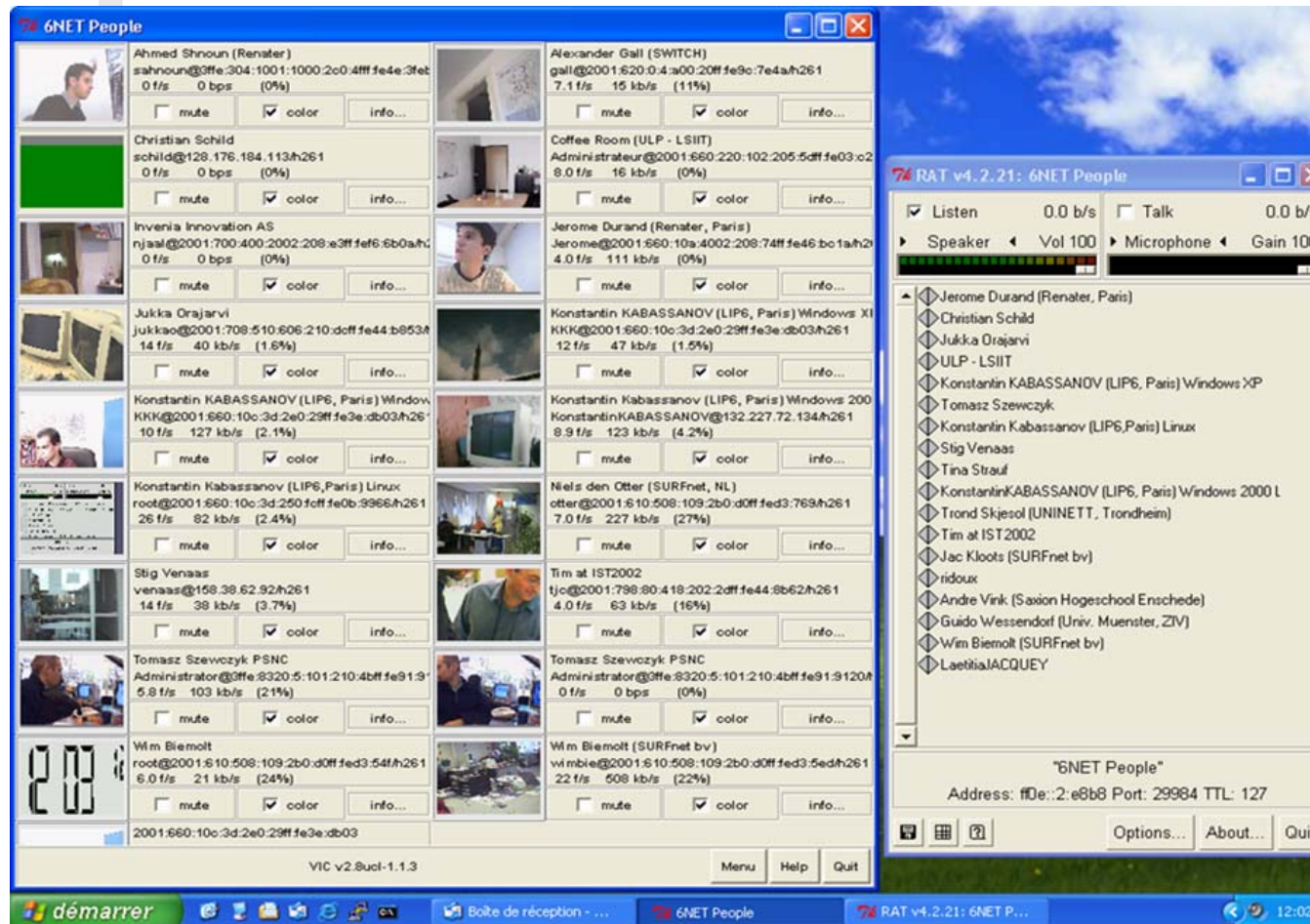
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Address http://6net.laares.info/apps.phtml

6net Applications summary

Click on the column headers to change sorting order

name ▼	category	class	summary	status	responsible	modified
6UMS	Streaming	C	IPv6-enabled unified messaging system	6UMS is being developed by UoS in Euro6IX, but will be made available to 6NET. Existing tools will be re-used where appropriate.	UoS	2003-01-16
Agent Framework	E-business	C	Framework for agent research	Available, in Java. Unicast works. Multicast not tested yet.	UoS	2003-01-24
AMUSE	Streaming	C	Adaptive MUltimedia Support Environment	Available. Usage limited to Sony and WP5. Work planned to support MobileIPv6.	Sony	2003-01-27
AWM	E-business	No	Application Workload Modeler	Released product with IPv6 support for zSeries. Needs special build for Linux/Intel.	IBM	2003-04-14
Bonephone	Streaming	B	Internet phone sending and receiving SIP messages	Demo version released.	FhG	2003-04-10
CDN	Edge Services	C	Content Distribution Networks	No specific work at the moment.	Cisco	2003-01-16
DVTS	Streaming	C	Application for sending and receiving Digital Video	The source and binaries for DVTS on various platforms are available from the DVTS URL.	UCL	2003-01-16
Edge Server	Edge Services	C	IBM Edge Server	Porting to IPv6 in progress.	IBM	2003-01-16
EGP	Gaming	No	Experimental Gaming Platform	Sony has stopped working on EGP. This activity has been dropped.	Sony	2003-03-27
FreeAMP	Streaming	A/B	Free unicast/multicast MP3 player	The code has been released on the web. Both a unicast and a multicast MP3 source will be activated in a network which will be available to all 6Net partners.	GARR	2003-01-24
FunnelWeb	E-business	C	Application level active services	Implemented as a Java application. Available on request within the project.	UCL	2003-01-16
Globus	E-business	C	GLOBUS toolkit (Grid)	Release 2.0 available. Globus 3.0 is expected early 2003. 6NET expectation is to get IPv6 support enabled as a patch for Globus 2.0, later as an integral part of Globus 3.0.	UCL	2003-01-16
GnomeMeeting	Streaming	C	Open source H323 Linux application	Deployment and support in progress for Greek Research Network community	GRNET	2003-02-05

Tool for sending and receiving MP3 HAT works on MSR IPv6 stack. Another version which works on

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HAT	Streaming	No	Tool for sending and receiving MP3 audio	HAT works on MSR IPv6 stack. Another version which works on Microsoft Tech Preview IPv6 will be released.	UCL	2003-01-22
Hypermedia LS	E-business	No	Hypermedia Link Services	Two servers available to experiment with an IPv6-enabled link service (output of 6WINIT)	UoS	2003-01-16
IBP	E-business	A	Internet Back Plane protocol - Middleware for Network Storage	Works. IPv6/IPv4. IPv6, if present, is automatically selected	GARR	2003-04-11
IRC	E-business	A	Internet Relay Chat communication system	Works.	GARR	2003-04-11
MCast6	Streaming	B	Tool for multimedia streaming in a computer network	Open source initiative. Mature versions will be widely available in the Internet. Architecture is designed to make other parties capable to change, adjust or add new modules.	PSNC	2003-01-22
MMCR	Streaming	No	Multicast MultiMedia Conference Recorder	Running. MMCR is fairly stable, and provides good performance.	UCL	2003-01-17
MPEG4IP	Streaming	B	Streaming video tool suite	Darwin Streaming Server will be ready by end 2003. Rest of MPEG4IP suite already ported to IPv6.	Telin	2003-04-23
MUD	Gaming	C	MUD gaming environment	Local to UoS. Can connect from anywhere via Telnet.	UoS	2003-01-16
Multicast Radio	Streaming	No	Multicast Radio	Running. Available to all within UoS site. Proprietary (doesn't currently use RTP).	UoS	2003-01-17
MUST	Streaming	C	MBONE Web-interface	Deployment and support in progress for Greek Research Network community	GRNET	2003-01-22
NTE	Streaming	C	Network Text Editor	NTE is currently fairly stable, and provides good performance. Further work is required on transcoding and support for interleaved formats.	UCL	2003-04-30
Open-LDAP	E-business	C	Open source implementation of the Lightweight Directory Access Protocol	Available. Ported to IPv6.	UNINETT	2003-01-17
OpenH323	Streaming	C	Open source H.323 protocol implementation	Test version on IPv6 available. Final application expected by end 2003.	CTI	2003-01-23
PKI	E-business	C	Public Key Infrastructure	Available on request within the project from the PKI URL.	UCL	2003-01-16
Portals	E-business	C/A	IBM Websphere Portal Technology	Equipment being prepared by IBM.	IBM	2003-03-26
Quake	Gaming	C	Multiplayer FPS action game	Works. Used at GARR.	Sony	2003-01-17
RAT	Streaming	A	Robust Audio Tool (audio	RAT is currently fairly stable, and provides good performance. Further work is required on transcoding and support for	UCL	2003-04-30

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Portals	E-business	C/A	IBM WebSphere Portal Technology	Equipment being prepared by IBM.		IBM	2003-05-28
Quake	Gaming	C	Multiplayer FPS action game	Works. Used at GARR.		Sony	2003-01-17
RAT	Streaming	A	Robust Audio Tool (audio conferencing)	RAT is currently fairly stable, and provides good performance. Further work is required on transcoding and support for interleaved formats.		UCL	2003-04-30
RQM	Streaming	C	RTP Quality Matrix (background tool for testing)	RQM is currently fairly stable, and provides good performance.		UCL	2003-01-16
SCS	Streaming	A	Secure Conference Store of conference information	SCS is currently fairly stable, and provides good performance.		UCL	2003-04-30
SDR	Streaming	No	Session Directory Tool	Not stabilised.		UCL	2003-04-30
SPAR	Streaming	A	SDP Parser Applet (component of SCS)	SPAR is currently stable, and provides good performance.		UCL	2003-04-30
TAG	E-business	C	Transcoding Active Gateway	Implemented in Java. JDK1.4 required if used in IPv6 environment. Initial release available for download to project partners.		UCL	2003-04-30
TUR	Streaming	A/B	Trondheim Underground Radio	Running. Publicly available. Multicast support planned by mid 2003.		UNINETT	2003-01-17
TZI-Gateway	E-business	C	Call signalling and media transcoding gateway	Supports IPv6 for SIP and H.323 on Linux-2.4 and Solaris (Intel). Tested with a number of agents/clients.		UCL	2003-01-16
VIC	Streaming	A	Video Conferencing Tool	VIC is currently fairly stable, and provides good performance. Further work is required on use of direct video display and integration of more codecs.		UCL	2003-04-30
VideoLAN	Streaming	A	Streaming video server and player	Works. Ported to IPv6 by Btexact for 6WINIT. May be good multicast and QoS demonstrator.		SURFnet	2003-05-08
VIP	Streaming	No	Video over IP (search and retrieval system)	Active at Telin. Central service would be delivered from Telin DataCenter through Surfnet		Telin	2003-01-17
VOCAL	Streaming	B	SIP-based VoIP client	The SIP user agents have been ported for use with IPv6 and are undergoing testing. Supports ENUM.		UoS	2003-01-20
WBD	Streaming	C	Whiteboard for conferencing	WDB is currently fairly stable, and provides good performance.		UCL	2003-01-16
XPilot	Gaming	C	Network game	Ported to IPv6. Field trial started.		UNINETT	2003-01-22

Add a description

Internet

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Further info

- 6NET (www.6net.org)
  - D6.3.3 *Final Report on IPv6 Management and Monitoring Architecture Design, Tools and Operational Procedures – Recommendations*
  - D6.2.4 *Final Report on IPv6 Management Tools, Developments and Tests*
- 6NET monitoring tool list (tools.6net.org)

Questions?

Thank you!