



**Router/4.4.0**

Version: 2874

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# Releases/Router/4.4.0

ImageStream Linux Version 4.4.0-72 is now available as a general availability (GA) release for all ImageStream routers.

This software release is provided at no charge to all ImageStream customers. Version 4.4.0-72 is a maintenance release that is recommended for all customers who wish to utilize the latest software enhancements for their ImageStream router.

This release note documents commands and features added between version 4.3.1 and version 4.4.0-72.

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## Router Minimum Requirements:

The 4.4.0 distribution requires a minimum of 128 MB RAM and a 128 MB flash drive.

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## KNOWN BUGS/Missing functionality:

PPPoA support is non-functional. The 4.4.0 release currently has no PPPoA support as the pppoany module has not been ported from 2.4 to 2.6.

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The following bugs have been fixed in Version 4.4.0:

### Multicast problems with VLANs affecting OSPF

Version 4.4.0-71 fixes an uninitialized field bug in the kernel which can cause multicast addresses to be removed instead of added to VLAN interfaces. This bug affects OSPF and can prevent neighbor packets from being received on an interface if VLANs are configured on that interface.

All customers who are running OSPF on VLAN interfaces should upgrade to release 71 or later.

### PCI 530 DS3/E3 Fixes

Version 4.4.0-34 fixes a transmit timed out race condition in the 530-DE driver.

### Multilink PPP small packet performance improvements

Version 4.4.0-63 changes the default transmit queueing method which dramatically reduces the number of dropped packets with small packet sizes and bursty traffic. This change improves Multilink PPP performance with 64, 128 and 256 byte packet sizes.

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## New Features in Version 4.4.0

4.4.0 utilizes the 2.6 kernel which adds many new features and performance improvements, SIP connection tracking, enhanced multi-processor support, and improved PPPoE/PPPoA/L2TP performance.

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### Detailed revision history:

#### revision 72

date: 2010/07/28  
MLPPP: Fix interoperability bug with Cisco IOS 12.3+ negotiating IPCP and IP6CP on the bundle.  
Add ATM length calculation to QOS library. To use, simply add "--calc\_atm" to your QOS\_IFACE statement and increase the bandwidth values to the true ATM cell rate of your DSL or ATM link.

Example for Embarq 3Mb / 512K service:

```
QOS_IFACE --name brSerial0.1 --policy default --max_in 3520 --max_out 768 \  
--max_latency 150 --fair_queue --calc_atm
```

#### revision 71

date: 2010/07/22  
OSPF/Multicast bugfix: Fix an uninitialized field bug with multicast addresses which could cause newly-added addresses on a VLAN to actually be removed from both the VLAN and master device instead of added. The da\_synced field was not initialized to 0 and as soon as the address was added to the VLAN a sync was called to copy the address to the master, but with da\_synced being uninitialized, if the value was non-zero the address would be removed.

Symptoms of this bug are OSPF sometimes fails to see neighbors on VLAN interfaces or master interfaces when running a mixed tagged/untagged setup on the same interface. Setting either the master or VLAN into promiscuous mode (tcpdump, etc) would allow the OSPF neighbors to establish a session as it would allow for the reception of packets on the special multicast MAC address for the 224.0.0.5 group.

#### revision 70

date: 2010/07/19  
PPP: Don't restart LCP if IPCP times out - not the right thing to do and can lead to kernel panic.

#### revision 69

date: 2010/07/01  
MLPPP: Ignore LCP requests with multilink headers. If IPCP is negotiated on the multilink bundle instead of an individual link, don't attempt to restart LCP on the multilink bundle if IPCP times out.

**revision 68**

date: 2010/06/25  
PPP: Fix a problem with IPv6CP not being negotiated from the timeout procedure.

**revision 67**

date: 2010/06/17  
Inetics: Re-enable IPv6 negotiation by default in PPP.

**revision 66**

date: 2010/06/15  
Add daemon keepalives to quagga daemons.

**revision 65**

date: 2010/06/11  
Recompile iptables/xtables modules to match kernel change in release 62.

**revision 64**

date: 2010/06/09  
SNMP: Update to version 5.5 which fixes a problem with an off-by-one interface index problem caused by an IPv6 tunnel interface in the 2.6 kernel.  
dhcprelay: Bind to the first client IP address and use this address as the "gateway" IP reported to the server.  
Quagga: Update to version 0.99.16. Also fix the menuTitle path that changed and caused init scripts to throw errors in release 62.

**revision 63**

date: 2010/05/18  
MLPPP: Do not strip off PPP header in the decapsulate function which fixes a bug where a queued packet would have its PPP header removed. Normally packets are sent immediately, but a control packet sent while the device was one packet away from being full would trigger this bug.

530-DE: Increase the hardware queueing from 1.9 ms to 24 ms. Also add locking around the rx interrupt routine and go ahead and process the rx and tx queues from the interrupt routine if hardware is down (OOF set).

Configmgr: Change the default queueing discipline to byte fifo (BFIFO) instead of the PFIFO which counted packets. This allows precise control of maximum latency and avoids problems with dropped packets when dealing with a burst of small packets. Queue lengths are set to 100 ms for T1/E1 and 50 ms for DS3/E3/OC3/OC12 and 10/100/1000 Ethernet. VLANs and tunnels default to 50 ms at the 100 Mbps rate which still provides 5 ms at GigE.

Configmgr: new command keyword added to allow setting the tx queue length in terms of bytes: "hold-queue <length in bytes> bytes". So to set the queue length on a T1 to 50 ms or 9600 bytes (1,536,000/8 = 192,000 bytes per second / 20 ) why /20? because 50 ms is 0.05 seconds and 1/0.05 is 20 (one-twentieth of a second).

### revision 62

date: 2010/05/07

Ramdisk resize: resize prior to extracting configuration to avoid an out of space condition with large configurations.

Remove gated menu options to fix a problem with long pathnames. This fixes menu bugs with certain Quagga menu items not functioning properly such as the OSPF enable script.

SNMP bugfix: Add sensors library to fix the broken snmpd daemon caused by the new sensor package in release 60.

### revision 61

date: 2010/05/05

Add support for the new R8168 GigE drivers for the R1 Atom board.

### revision 60

date: 2010/04/29

Voltage/Temperature sensors now function but may not show correct ALARM status.

### revision 59

date: 2010/04/29

Add Coova-Chilli captive portal package.

### revision 58

date: 2010/04/26

Disable kernel preempt to avoid some locking issues with the e1000 driver.

### revision 57

date: 2010/04/23

Forced speed/duplex now takes the interface down prior to setting.

Previously if the interface was up and transferring traffic a bug in the Intel E1000e driver could be triggered when restarting N-Way autonegotiation. This bug would lead to an overload of kernel debug statements about scheduling while not atomic. Taking down the interface when changing speed or duplex on an interface solves this problem.

ADSL(PCI 300): Update to latest firmware/hardware driver.

530-TEJ: Fix a bug which prevented the configuration of 56K timeslots.

PPP: Fix a negotiation problem which caused an entire IPCP configure request to be rejected when the peer was asking for his IP address and an unsupported parameter was present. We now NAK the request for his IP address but only if we accept all other parameters. The symptom of this problem was that protocol would come up for a fraction of a second and go back down until the next configure cycle.

### revision 56

date: 2010/04/05

PPP: bwlimit\_iface: change default setting of verbose to off.

Inetics: Compile configmgr shared in RBE to avoid PPPoE/PPPoA server crash.

#### revision 55

date: 2010/03/29

Remove NO\_HZ option from the kernel which was causing problems on certain hardware platforms.

#### revision 54

date: 2010/03/10

PPP: Fix a RADIUS plugin bug which caused the ppp daemon to hand out a pool IP address instead of the RADIUS server assigned IP and also failed to negotiate because the peer was not authorized to use the pool IP.

#### revision 53

date: 2010/02/26

Configmgr: Fix a bug which caused RADIUS information to be ignored for Virtual Template interfaces other than the first.

Change default PPPoE/PPPoA bwlimit type from POLICER to HTB.

#### revision 52

date: 2010/02/22

Bridging: Use 1024 bytes instead of 1900 for the command length as bash can fail at around 1890+.

530-TEJ: Fix an Rx overflow problem that could cause a port to stop receiving data in channelized mode when the T1/E1 loses signal and comes back.

#### revision 51

date: 2010/02/03

Fix problems with bridges not removing IP addresses properly.

Fix shutdown problems with bridges, Ethernet, VLANs and tunnels.

- If an interface was marked as shutdown when Inetics loaded the interface could not be brought up without changing a parameter on the interface.

#### revision 50

date: 2010/02/02

Add ltmodem support for dialout-ppp.

#### revision 49

date: 2010/01/29

Revert back to Quagga 0.99.15 without MPLS support to resolve IPv6 problems.

Add BGP scan timer load check to avoid a condition where the workqueue is never able to be depleted due to lack of CPU time.

#### revision 48

date: 2010/01/21

Recompile kernel with virtualization support.

dhcrelay: Fix a crash bug in options parsing from malformed packets.  
Inetics: All interfaces now default to point-to-point which eliminates the need to set the point-to-point flag in Quagga for OSPF.

**revision 47**

date: 2010/01/18  
Add RADIUS login support.

**revision 46**

date: 2010/01/15  
Configmgr bugfix: Allow PPPoE server mode to run on bridge interfaces (bvi).

**revision 45**

date: 2010/01/13  
Bugfixes for TACACS+ login support.

**revision 44**

date: 2010/01/11  
Fix TACACS+ login support so local users do not have to be present in /etc/passwd.  
Add OSPFv3 (ospf6d) support for OSPF and IPv6.

**revision 43**

date: 2009/12/21  
Kernel: Add support for the latest Intel E1000e chipsets.  
Inetics: Fix a long-standing bug with Frame Relay IARP replying with 0.0.0.0 as our IP.  
Failsafe: Fix a kernel boot bug with older ramdisks that had serial numbers.

**revision 42**

date: 2009/12/07  
Allow multiple ip helper commands (DHCP Relay)

**revision 41**

date: 2009/11/17  
Add Quagga 0.99.15 with MPLS and LDP support.

**revision 40**

date: 2009/11/13  
Add pufq support to qos library.

**revision 39**

date: 2009/10/27  
Add Quagga 0.99.15.

**revision 38**

date: 2009/10/20

Configmgr: missed a commit that fixes argument parsing for user chains. Previously only the first argument was read.

**revision 37**

date: 2009/10/14

Add logger and eth\_header user chains to allow cross-connecting a WAN port with Ethernet.

**revision 36**

date: 2009/10/08

Add new QoS library and default QoS script for low latency queueing and class-based queueing.

**revision 35**

date: 2009/10/06

Change transmit queue on VLANs from 0 to 1000 so QoS can be configured.  
Dead gateway detection now only works on the default route so that interface routes don't get routed out a default gateway on wireless networks that throttle ARP requests.

**revision 34**

date: 2009/09/16

sandcore: Call hardware reset routine via workqueue (thread context can sleep)  
440: Add hardware reset routine which calls load\_firmware().  
configmgr-ppp: Add load average and memory limits based on free + cache.

date: 2009/09/18

PPP: Don't initiate IPV6CP by default but respond if the other end request it.  
Also clean up include files to allow compilation under 4.2  
530-DE: Fix a race condition bug which caused the driver to detect a transmit timeout when none had really occurred.  
This race was much more likely to occur when a substantial amount of traffic is transmitted from a userspace thread such as OpenVPN rather than forwarded from another card in interrupt context.

**revision 33**

date: 2009/09/04

ISDN fixes and updates.  
Add preliminary IPv6 support to configmgr and PPP (IPV6CP support).

**revision 32**

date: 2009/08/26

Add support for the new PMC version of the QuadISDN adapter.

**revision 31**

date: 2009/08/23

DHCP server: Fix a segmentation fault problem with the recent shared-network update.

### revision 30

date: 2009/08/19

Add fixed Quad-port ISDN driver. Fix image-based update scripts to support images larger than 25 MB.

### revision 29

date: 2009/08/19

Add support for Image-based updates.

### revision 28

date: 2009/08/14

POS OC3: Use watchdog polling again for hardware status detection.

Asterisk: Add support for Asterisk 1.4.26.1, dahdi 2.2.0.1 and web-gui 2.0.4.

### revision 27

date: 2009/07/30

Add support for Perl 5.10.0 add-on package.

### revision 26

date: 2009/07/29

Add POS/OC3 support for the 4.4 distro.

Support multiple cards and integrate latest OC3/OC12 DDK.

Sandnone: Increase max rx buffers to 512 for high speed.

### revision 25

date: 2009/07/26

dhcp server: Allow multiple subnets per interface via automatic shared network support for subnets on the same interface.

### revision 24

date: 2009/07/06

Configmgr: Fix ISDN shutdown problem with 4.4. Fix for ISDN switch protocol not being set with 4-port card.

### revision 23

date: 2009/07/02

Add snmpset utility.

### revision 22

date: 2009/06/30

Quagga: Add 0.99.13 which fixes a problem with BGP and IPv6. Also added support for ospf6d.

**revision 21**

date: 2009/06/23  
Add updated sed utility.

**revision 20**

date: 2009/06/18  
Add ixb Intel GigE driver.  
Patch to kernel to remove WARN\_ON debug message in skb\_gso\_segment() which was causing certain routers with bridging and vlan configurations to become overloaded and drop packets.

**revision 19**

date: 2009/06/16  
Added powercode package.

**revision 18**

date: 2009/06/12  
Added iptraf/iftop to stats.  
Fix a firewall status bug that didn't detect when NAT is loaded and would not offer to show NAT rules.

**revision 17**

date: 2009/06/11  
Fix ADSL problem overwriting chap & pap secrets file when each client launches.  
Add "ppp debug" option to ADSL & BRI interfaces.

**revision 16**

date: 2009/06/09  
Recompile with 586 support for Transports.

**revision 15**

date: 2009/06/05  
Update 300 series ADSL driver with hardware status support.

**revision 14**

date: 2009/05/22  
OpenSSH: Update to 5.2p1  
OpenSSL: Update to 0.9.8k

**revision 13**

date: 2009/04/30  
Quagga: Bugfix for bgpd crash on long 32-bit ASNs:  
(<http://lists.quagga.net/pipermail/quagga-users/2009-February/010342.html>)

revision 12

date: 2009/04/23  
Added pcnet32 net driver for VMs.

revision 11

date: 2009/04/02  
Add ISis300 PCI ADSL2/2+ support.

revision 10

date: 2009/02/24  
Add the Envoy reboot patch to Envoy routers properly soft reboot.

revision 9

date: 2009/02/13  
Fix for BGP TCP/MD5 with Quagga 0.99.11.

revision 8

date: 2009/02/04  
POS/OC12: Change DDK to use wait queues instead of semaphores and debug level from 9 to 7 to avoid long boot times.

revision 7

date: 2009/02/03  
POS/OC12: Really add the new ddk.

revision 6

date: 2009/02/03  
POS/OC12: Added xsconsole debug utility, update OC12 firmware to fix a problem with high number of phy interrupts caused by the last update.

revision 5

date: 2009/01/30  
Recompile kernel and modules in original build environment.

revision 4

date: 2009/01/27  
POS/OC12: Remove Rx patch for the OC12 DDK.  
520,600/800,POS/OC12,1000: Added proprietary license.

revision 3

date: 2009/01/23  
POS/OC12: Add support for jumbo frames via ethernet cross connect up to 9K.

**revision 2**

date: 2009/01/17  
Kernel: Added tcp advanced congestion routines to allow better performance on satellite links.  
Added all current addon package support from 4.2.12.

**revision 1**

date: 2008/12/11  
Start of 4.4.0 from 4.4.0-pre53

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**Detailed revision history for 4.4.0-pre:****revision 53**

date: 2008/12/09  
RADIUS: Fix NULL pointer dereference if no gateway is sent for the Framed-Route option.

**revision 52**

date: 2008/12/08  
E1000/E1000E: Set netdev->irq right before request\_irq(). It wasn't being set at all resulting in configmgr's inability to set up SMP affinity.  
  
Configmgr: Run the SMPAffinity routine after interfaces are brought up because under 2.6 some ethernet devices have their IRQs remapped on open.  
  
ATM: Fix encapsulation aal5autoppp so that it will properly sense frames without SNAP headers. Previously we required SNAP headers to autosense. Now we also switch our transmit mode between SNAP and MUX PPP to match the frames being received.

**revision 51**

date: 2008/12/08  
Fix e1000/e1000e drivers to add netdev->irq so smp affinity works from configmgr.

**revision 50**

date: 2008/12/06  
e1000e driver: Change watchdog interval from 2s to 1s so stats updates properly.  
Fix a tx spinlock issue that was causing requeues. This driver was using a common adapter->tx\_queue\_lock in both the tx and tx\_cleanup routines. The e1000 driver uses a tx\_ring->tx\_lock for the tx routine and the adapter->tx\_queue\_lock for the tx\_cleanup routine. I changed the e1000e driver to use 2 locks like the e1000 driver.

**revision 49**

date: 2008/12/04  
Increase per-process file limit from 1024 to 8192 in /usr/share/profile.d/00environment.sh so L2TP can support more than 512 tunnels.

revision 48

date: 2008/12/02 17:46:29; author: sandcomp; state: Exp; lines: +1 -1  
Integrate l2tp support with configmgr. Also use my original ippool with pppd.  
Update quagga to 0.99.10 from 4.2.12.

revision 47

date: 2008/11/12  
440: Added a global 5 second delay in sand\_probe() for to allow cards with old  
firmware to initialize. This workaround is needed on systems with a mix of old  
and new cards.  
configmgr: Remove the sethorizon option for brctl from distributions other than  
4.4.0-pre which don't support it.

revision 46

date: 2008/11/10  
440: Update to June 30 drivers which fixes a stuck transmitter bug and an initialization problem on ca

revision 45

date: 2008/11/04  
SAND: Fix a problem with some protocols that use sand\_hw\_driver\_xmit() that  
wasn't being exported properly.

revision 44

date: 2008/11/03  
Add conntrack util support. We can now add/remove/list connections as well  
as flush the entire table.

revision 43

date: 2008/10/31  
Add custom ethernet modprobe for RR1000-GE to probe E1000 first.

revision 42

date: 2008/10/29  
Remove udp\_csum call that was causing a kernel panic when sessions were being  
torn down. Fix socket usage count by adding an extra sock\_put() call to the  
session teardown code. This call should be placed elsewhere but I don't know  
exactly where it belongs.

revision 41

date: 2008/10/23  
Upated kernel, added Wireless Extensions. Needed to support madwifi.  
Updated udhcp package from 0.

revision 40

date: 2008/10/14  
Port pppd/radius plugin patches from 2.4.2b3 and change openl2tp to not load the pppd radattr.so plugin that depends on the other radius plugin.

### revision 39

date: 2008/10/03  
Added ext3 resizing support to allow ramdisk resizing.  
Changed the ramdisk to be an ext3 filesystem with only 1M journal (smallest possible).

### revision 38

date: 2008/10/02  
Added e1000e PCI Express driver for the Intel E1000.  
QOS: Remove /etc/rc.d/rc.router/S90QOS symlink from the package. This prevented users from disa

### revision 37

date: 2008/09/24  
Added updated software packages for openl2tp version 1.15, pppd 2.4.4 and ippool-1.3 which is a network-based IP pool manager allowing pools to be shared between routers.

### revision 36

date: 2008/09/19  
POS/OC3/OC12: Added support for ethernet cross-connect for the OC12 port to provide line rate down to 256 byte packets.

New command:  
service-module oc12 xconnect eth3

Specify the cross-connect ethernet device name using old-school Linux names for 4.4.0-pre.

You must have a GigE SFP in the bottom port on the OC12 card cabled to another GigE port on the OC12 card. The GigE port is the port you specify in the service-module xconnect command.

\*note\* For copper SFPs, use a straight through cable to connect the GigE ports. Fiber should be Tx <-> Rx.

\*IMPORTANT\* Be sure to configure IP addresses on the cross-connect Ethernet device and not the

Several changes were made to Inetics and our xs155 driver to support x-connect:

- Hardware status (netif\_carrier) follows protocol status for the OC12 serial interface. This required finally implementing the proto\_change chain execution and registering a proto\_change callback chain for the xs2000.
- Configmgr has hooks to set up bandwidth limits on Ethernet devices. The xs155 hardware module for configmgr sets up a 601 Mbps tx rate limit on the cross-connect device. I just call the same configure\_port\_bwlimit() function that I call for protocol subs. It sets up a single HTB qdisc+class with the proper rate and r2q values for the rate.

PPP: For testing purposes added a command to ignore loopback. This should disable loopback dete

for all L2 protocols. Right now PPP is the only one which does loopback detection.

New command:  
ignore-loopback

Stats: for ethernet devices make protocol status follow hardware status (down/up didn't make sense!)

#### revision 35 date: 2008/09/08

xs155: Remove all periodic watchdog timers -- lockup was observed in xs155\_sleep().  
What those timers do has not been debugged with the new DDKs.

#### revision 34 date: 2008/09/03

More (hopefully final) fixes for the POS/OC12 driver. Also fix SAND so it brings up interfaces before adding IPs so Quagga sees interface routes properly under 2.6.

#### revision 33

date: 2008/08/28  
Revert back to 0.99.7 for velocity online

#### revision 32

date: 2008/08/27  
Finally fix problems with locking around the hw\_xmit function to allow the sand\_tx\_callback to properly retransmit control packets that had to be queued. The last commit had problems and resulted in lockups, BUG: Scheduling while atomic errors.

#### revision 31

date: 2008/08/25  
sandcore/protocols: Call netif\_carrier\_on/off on proto up/down for kernel >= 2.6.23  
Also change all protocols to call dev->hard\_start\_xmit() directly again for kernel >= 2.6.23 instead of dev\_queue\_xmit(). I will have to check all hardware drivers to ensure they don't call the sand\_tx\_callback with interrupts disabled or their own device spinlocks held. They shouldn't and my old drivers didn't.

What does this mean?

Pros:

- 1) Solve the SMP race bug where setting dev->tx\_queue\_len++ didn't really guarantee your keepalive packets
- 2) Allow netif\_carrier\_on/off() to be called so the Linux networking layers won't send us packets and

Cons:

- 1) It's now possible for the hardware driver's tx routine to get reentered. All our hardware drivers s
- 2) Calling dev\_queue\_xmit() instead of the hardware xmit was the original solution to some transmit ti
- 3) You won't see L2 protocol packets in tcpdump anymore (maybe a pro)

#### revision 30

date: 2008/08/22  
Remove tickless kernel support - back to 1000 HZ. Add the dead route patch.

**revision 29**

date: 2008/08/13  
Recompile with tickless kernel.

**revision 28**

date: 2008/08/04  
Install latest vconfig recompiled without c++ dependancy.  
Install current libstdc++ library from gcc 3.3.4 required by Squid, Snort and our upcoming configmgr.

**revision 27**

date: 2008/07/31  
Fix broken OC12 driver from last temp release -- I broke it with compatability code designed to make the xs155.o driver still compile against the old ddk/oc3 card.

**revision 26**

date: 2008/07/30  
xs155: Fix Rx corruption bug. Add xssfpci and a script to run it and fetch information on card 0 port 0 (sfp\_diag) temporarily to sand.

**revision 25**

date: 2008/07/22  
Fix openvpn server mode script bug that logged authentication requests to /tmp/scott

**revision 24**

date: 2008/06/25  
Increase RAMDISK size to 54MB from 45 MB.  
Add latest SAND package with new xs155 driver -- (xs-2000) OC12 support.  
Add lspci to base binaries.

**revision 23**

date: 2008/06/02  
Add support for addon hard drive, apache and wireshark. Add dev files for hd[bcdefgh] from the latest 4.2.12-pre beta.  
Add kernel support for ext3 and DMA on hard drives.

**revision 22**

date: 2008/03/27  
Added new tcpdump

**revision 21**

date: 2008/03/24  
Add latest quagga/mppls code.

**revision 20**

date: 2008/03/17  
Opencalea: Add syslog debugging to tap and lea\_collection. Add statistics file to both programs as well. tap is in /tmp/tap\_%d.status (pid) and lea\_collection is /tmp/collector\_%d.status (pid).

**revision 19**

date: 2008/03/10  
Add Web administration base package.

**revision 18**

date: 2008/02/21  
Fix IPv6 iproute2 command support in configmgr.

**revision 17**

date: 2008/02/20  
Compiled in IPv6 support into kernel.  
Removed IPv6 kernel module from kernel-modules package.  
Add binaries ping6, traceroute6, tracepath6 to Base-networking package.  
Added support for IPv6 tunnels to iproute2 ip command.

**revision 16**

date: 2008/02/15  
Add Quagga 0.99.9 with MPLS patches, ldpd and rsvpd.

**revision 15**

date: 2008/02/06  
Add split horizon support to bridging.

**revision 14**

date: 2008/02/05  
Recommitting everything due to corrupted repository.

**revision 13**

date: 2008/02/04  
Fix for kernel panic when frames > dev->mtu are sent via mpls tunnel.

**revision 12**

date: 2008/02/01  
Change skb headroom from 16 to 32.

**revision 11**

date: 2008/01/30

Fixes to allow VPLS bridging over MPLS.

#### revision 10

date: 2008/01/25

Change mpls core to allow baby giants up to 40 bytes > device MTU for bridged mpls packets.

#### revision 9

date: 2008/01/23

Added MPLS ebttables kernel modules.

#### revision 8

date: 2008/01/15

Added quagga 0.99.6 with MPLS support.

#### revision 7

date: 2008/01/09

Added base MPLS support.

#### revision 6

date: 2007/12/17

Add missing NOTRACK target.

#### revision 5

date: 2007/12/14

Add tulip/LMC/SBE patch

#### revision 4

date: 2007/12/13

Added KVM support and USB mass storage support.

#### revision 3

date: 2007/12/12

Fix loopback support - use modprobe for dummy not insmod

#### revision 2

date: 2007/12/07

Rev to rel2

#### revision 1

date: 2007/11/19

Start of 4.4.0-pre cut from 4.3.1-13. This tree is designed for 2.6 support for all routers. For now I have ethernet and most wan card support. This release is for SIP NAT and

contrack support for a Rebel customer.