Characterizing and Predicting Blocking Bugs in Open Source Projects

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Abstract

Software engineering researchers have studied specific types of issues such re-opened bugs, performance bugs, dormant bugs, etc. However, one special type of severe bugs is *blocking bugs*. *Blocking bugs* are software bugs that prevent other bugs from being fixed. These bugs may increase maintenance costs, reduce overall quality and delay the release of the software systems. In this paper, we study *blocking bugs* in eight open source projects and propose a model to predict them early on. We extract 14 different factors (from the bug repositories) that are made available within 24 hours after the initial submission of the bug reports. Then, we build decision trees to predict whether a bug will be a *blocking bugs* or not. Our results show that our prediction models achieve F-measures of 21%-54%, which is a two-fold improvement over the baseline predictors. We also analyze the fixes of these *blocking bugs* to understand their negative impact. We find that fixing *blocking bugs* requires more lines of code to be touched compared to *non-blocking bugs*. In addition, our file-level analysis shows that files affected by *blocking bugs* are more negatively impacted in terms of cohesion, coupling complexity and size than files affected by *non-blocking bugs*.

Keywords: Process Metrics, Code Metrics. Post-release Defects

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Blocking bugs Dataset. We provide our dataset (bug-fix, code-metrics and bug-report data) in our url-address, so everyone interested can replicate our experiments and calculate more fine-grained performance metrics. https://github.com/harold-valdivia-garcia/blocking-bugs/blob/master/blocking-ds.zip

Dealing with the Reporter's name factor

Table 1: Comparison between Decision Tree models with and without Reporter's name

	Decision Tree model without Reporter's name			Decision Tree model with Reporter's name		
Project	**Precision**	**Recall**	**F-measure**	**Precision**	**Recall**	**F-measure**
Chromium	15.0%	56.0%	**23.7%**	15.7%	59.5%	**24.8%**
Eclipse	12.5%	46.0%	**19.7%**	14.0%	49.5%	**21.9%**
FreeDesktop	20.4%	51.6%	**29.2%**	24.8%	60.3%	**35.2%**
Mozilla	34.7%	59.9%	**44.0%**	36.1%	63.4%	**46.0%**
NetBeans	13.5%	47.1%	**21.0%**	15.7%	52.9%	**24.2%**
OpenOffice	13.5%	49.5%	**21.2%**	14.7%	54.2%	**23.1%**
Gentoo	12.3%	41.6%	**19.0%**	13.7%	47.7%	**21.2%**
Fedora	44.6%	66.2%	**53.3%**	45.8%	66.7%	**54.3%**

Bug-fix Collection

Table 2: Downloaded Products by Projects

Project	Product	Repo
Chromium	Chromuim	http://git.chromium.org/chromium/chromium.git
Eclipse	platform-eclipse.platform.common	git://git.eclipse.org/gitroot/platform/eclipse.platform.common.git/
	platform-eclipse.platform.debug	git://git.eclipse.org/gitroot/platform/eclipse.platform.debug.git/
	platform-eclipse.platform	git://git.eclipse.org/gitroot/platform/eclipse.platform.git/
	platform-eclipse.platform.news	git://git.eclipse.org/gitroot/platform/eclipse.platform.news.git/
	platform-eclipse.platform.releng.aggregator	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.aggregator.git/
	platform-eclipse.platform.releng.basebuilder	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.basebuilder.git/
	platform-eclipse.platform.releng.buildtools	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.buildtools.git/
	platform-eclipse.platform.releng.eclipsebuilder	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.eclipsebuilder.git/
	platform-eclipse.platform.releng	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.git/
	platform-eclipse.platform.releng.maps	git://git.eclipse.org/gitroot/platform/eclipse.platform.releng.maps.git/
	platform-eclipse.platform.resources	git://git.eclipse.org/gitroot/platform/eclipse.platform.resources.git/
	platform-eclipse.platform.runtime	git://git.eclipse.org/gitroot/platform/eclipse.platform.runtime.git/
	platform-eclipse.platform.swt.binaries	git://git.eclipse.org/gitroot/platform/eclipse.platform.swt.binaries.git/
	platform-eclipse.platform.swt	git://git.eclipse.org/gitroot/platform/eclipse.platform.swt.git/
	platform-eclipse.platform.team	git://git.eclipse.org/gitroot/platform/eclipse.platform.team.git/
	platform-eclipse.platform.text	git://git.eclipse.org/gitroot/platform/eclipse.platform.text.git/
	platform-eclipse.platform.ua	git://git.eclipse.org/gitroot/platform/eclipse.platform.ua.git/
	platform-eclipse.platform.ui	git://git.eclipse.org/gitroot/platform/eclipse.platform.ui.git/
	jdt-eclipse.jdt.core.binaries	git://git.eclipse.org/gitroot/jdt/eclipse.jdt.core.binaries.git/
	jdt-eclipse.jdt.core	git://git.eclipse.org/gitroot/jdt/eclipse.jdt.core.git/
	jdt-eclipse.jdt.debug	git://git.eclipse.org/gitroot/jdt/eclipse.jdt.debug.git/
	jdt-eclipse.jdt	git://git.eclipse.org/gitroot/jdt/eclipse.jdt.git/
	jdt-eclipse.jdt.ui	git://git.eclipse.org/gitroot/jdt/eclipse.jdt.ui.git/
	equinox-rt.equinox.binaries	git://git.eclipse.org/gitroot/equinox/rt.equinox.binaries.git/
	equinox-rt.equinox.bundles	git://git.eclipse.org/gitroot/equinox/rt.equinox.bundles.git/
	equinox-rt.equinox.framework	git://git.eclipse.org/gitroot/equinox/rt.equinox.framework.git/
	equinox-rt.equinox.incubator	git://git.eclipse.org/gitroot/equinox/rt.equinox.incubator.git/
	equinox-rt.equinox.p2.cudf	git://git.eclipse.org/gitroot/equinox/rt.equinox.p2.cudf.git/
	equinox-rt.equinox.p2	git://git.eclipse.org/gitroot/equinox/rt.equinox.p2.git/
	mdt-org.eclipse.ocl	git://git.eclipse.org/gitroot/mdt/org.eclipse.ocl.git
	mdt-papyrus-org.eclipse.papyrus	git://git.eclipse.org/gitroot/papyrus/org.eclipse.papyrus.git
	mdt-sphinx-org.eclipse.sphinx	git://git.eclipse.org/gitroot/sphinx/org.eclipse.sphinx.git
	tm-org.eclipse.tm	git://git.eclipse.org/gitroot/tm/org.eclipse.tm.git/
	cdt-org.eclipse.cdt	git://git.eclipse.org/gitroot/cdt/org.eclipse.cdt.git/
	eclipselink-eclipselink.runtime	git://git.eclipse.org/gitroot/eclipselink/eclipselink.runtime.git/
	eclipselink-eclipselink.releng	git://git.eclipse.org/gitroot/eclipselink/eclipselink.releng.git/
	eclipselink-incubator	git://git.eclipse.org/gitroot/eclipselink/incubator.git/
	eclipselink-javax.persistence	git://git.eclipse.org/gitroot/eclipselink/javax.persistence.git/
	mylyn-org.eclipse.mylyn.all	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.all.git/
	mylyn-org.eclipse.mylyn.builds	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.builds.git/
	mylyn-org.eclipse.mylyn.commons	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.commons.git/
	mylyn-org.eclipse.mylyn.context	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.context.git/
	mylyn-org.eclipse.mylyn.docs	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.docs.git/
	mylyn-org.eclipse.mylyn	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.git/
	mylyn-org.eclipse.mylyn.incubator	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.incubator.git/
	mylyn-org.eclipse.mylyn.reviews	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.reviews.git/
	mylyn-org.eclipse.mylyn.tasks	git://git.eclipse.org/gitroot/mylyn/org.eclipse.mylyn.tasks.git/
	pde-eclipse.pde.build	git://git.eclipse.org/gitroot/pde/eclipse.pde.build.git/
	pde-eclipse.pde	git://git.eclipse.org/gitroot/pde/eclipse.pde.git/
	pde-eclipse.pde.incubator	git://git.eclipse.org/gitroot/pde/eclipse.pde.incubator.git/
	pde-eclipse.pde.ui	git://git.eclipse.org/gitroot/pde/eclipse.pde.ui.git/
	rap-org.eclipse.rap	git://git.eclipse.org/gitroot/rap/org.eclipse.rap.git/
	rap-org.eclipse.rap.tools	git://git.eclipse.org/gitroot/rap/org.eclipse.rap.tools.git/
	rap-incubator-org.eclipse.rap.incubator.releng	git://git.eclipse.org/gitroot/rap/incubator/org.eclipse.rap.incubator.releng.git/
	orion-org.eclipse.orion.client	git://git.eclipse.org/gitroot/orion/org.eclipse.orion.client.git/

	orion-org.eclipse.orion.design	git://git.eclipse.org/gitroot/orion/org.eclipse.orion.design.git/
	orion-org.eclipse.orion.marketplace	git://git.eclipse.org/gitroot/orion/org.eclipse.orion.marketplace.git/
	orion-org.eclipse.orion.server	git://git.eclipse.org/gitroot/orion/org.eclipse.orion.server.git/
	orion-orion-parent	git://git.eclipse.org/gitroot/orion/orion-parent.git/
	emf-org.eclipse.emf	git://git.eclipse.org/gitroot/emf/org.eclipse.emf.git/
	birt	https://github.com/eclipse/birt.git
	linuxtools-org.eclipse.linuxtools.eclipse-build	git://git.eclipse.org/gitroot/linuxtools/org.eclipse.linuxtools.eclipse-build.git/
	linuxtools-org.eclipse.linuxtools	git://git.eclipse.org/gitroot/linuxtools/org.eclipse.linuxtools.git/
	tptp-org.eclipse.tptp.platform	git://git.eclipse.org/gitroot/tptp/org.eclipse.tptp.platform.git/
	tptp-org.eclipse.tptp.test-results	git://git.eclipse.org/gitroot/tptp/org.eclipse.tptp.test-results.git/
	tptp-org.eclipse.tptp.test	git://git.eclipse.org/gitroot/tptp/org.eclipse.tptp.test.git/
	tptp-org.eclipse.tptp.trace	git://git.eclipse.org/gitroot/tptp/org.eclipse.tptp.trace.git/
	virgo-org.eclipse.virgo.nano	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.nano.git/
	virgo-org.eclipse.virgo.web	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.web.git/
	virgo-org.eclipse.virgo.util	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.util.git/
	virgo-org.eclipse.virgo.snaps	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.snaps.git/
	virgo-org.eclipse.virgo.medic	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.medic.git/
	virgo-org.eclipse.virgo.kernel-tools	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.kernel-tools.git/
	virgo-org.eclipse.virgo.kernel	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.kernel.git/
	virgo-org.eclipse.virgo.web-server	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.web-server.git/
	virgo-org.eclipse.virgo.apps	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.apps.git/
	virgo-org.eclipse.virgo.documentation	git://git.eclipse.org/gitroot/virgo/org.eclipse.virgo.documentation.git/
	ecf-ecf	git://git.eclipse.org/gitroot/ecf/ecf.git/
	ecf-org.eclipse.ecf	git://git.eclipse.org/gitroot/ecf/org.eclipse.ecf.git/
	e4-org.eclipse.e4.ui	git://git.eclipse.org/gitroot/e4/org.eclipse.e4.ui.git/
	e4-org.eclipse.e4.tools	git://git.eclipse.org/gitroot/e4/org.eclipse.e4.tools.git/
	e4-org.eclipse.e4.resources	git://git.eclipse.org/gitroot/e4/org.eclipse.e4.resources.git/
	e4-org.eclipse.e4.search	git://git.eclipse.org/gitroot/e4/org.eclipse.e4.search.git/
	e4-org.eclipse.e4.releng	git://git.eclipse.org/gitroot/e4/org.eclipse.e4.releng.git/
FreeDesktop	cairo	git://anongit.freedesktop.org/cairo
	dbus-dbus	git://anongit.freedesktop.org/dbus/dbus
	dbus-dbus-glib	git://anongit.freedesktop.org/dbus/dbus-glib
	dbus-dbus-java	git://anongit.freedesktop.org/dbus/dbus-java
	dbus-dbus-python	git://anongit.freedesktop.org/dbus/dbus-python
	dbus-dbus-qt	git://anongit.freedesktop.org/dbus/dbus-qt
	dbus-dbus-qt3	git://anongit.freedesktop.org/dbus/dbus-qt3
	dbus-dbus-test	git://anongit.freedesktop.org/dbus/dbus-test
	intel-vaapi-intel-driver	git://anongit.freedesktop.org/vaapi/intel-driver
	intel-vaapi-libva	git://anongit.freedesktop.org/vaapi/libva
	libreoffice-artwork	git://anongit.freedesktop.org/libreoffice/artwork
	libreoffice-base	git://anongit.freedesktop.org/libreoffice/base
	libreoffice-binfilter	git://anongit.freedesktop.org/libreoffice/binfilter
	libreoffice-bootstrap	git://anongit.freedesktop.org/libreoffice/bootstrap
	libreoffice-build	git://anongit.freedesktop.org/libreoffice/build
	libreoffice-calc	git://anongit.freedesktop.org/libreoffice/calc
	libreoffice-components	git://anongit.freedesktop.org/libreoffice/components
	libreoffice-contrib-buildbot	git://anongit.freedesktop.org/libreoffice/contrib/buildbot
	libreoffice-contrib-dev-tools	git://anongit.freedesktop.org/libreoffice/contrib/dev-tools
	libreoffice-contrib-gitdm-config	git://anongit.freedesktop.org/libreoffice/contrib/gitdm-config
	libreoffice-contrib-mso-dumper	git://anongit.freedesktop.org/libreoffice/contrib/mso-dumper
	libreoffice-contrib-ooeclipse	git://anongit.freedesktop.org/libreoffice/contrib/ooeclipse
	libreoffice-contrib-svn-to-git	git://anongit.freedesktop.org/libreoffice/contrib/svn-to-git
	libreoffice-contrib-test-files	git://anongit.freedesktop.org/libreoffice/contrib/test-files
	libreoffice-core	git://anongit.freedesktop.org/libreoffice/core
	libreoffice-cppunit	git://anongit.freedesktop.org/libreoffice/cppunit
	libreoffice-dictionaries	git://anongit.freedesktop.org/libreoffice/dictionaries
	libreoffice-extensions	git://anongit.freedesktop.org/libreoffice/extensions
	libreoffice-extras	git://anongit.freedesktop.org/libreoffice/extras
	libreoffice-filters	git://anongit.freedesktop.org/libreoffice/filters
	libreoffice-help	git://anongit.freedesktop.org/libreoffice/help

	libreoffice-impress	git://anongit.freedesktop.org/libreoffice/impress
	libreoffice-impress_remote	git://anongit.freedesktop.org/libreoffice/impress_remote
	libreoffice-l10n	git://anongit.freedesktop.org/libreoffice/l10n
	libreoffice-libabw	git://anongit.freedesktop.org/libreoffice/libabw
	libreoffice-libcdr	git://anongit.freedesktop.org/libreoffice/libcdr
	libreoffice-libetonyek	git://anongit.freedesktop.org/libreoffice/libetonyek
	libreoffice-libexttextcat	git://anongit.freedesktop.org/libreoffice/libexttextcat
	libreoffice-libfreehand	git://anongit.freedesktop.org/libreoffice/libfreehand
	libreoffice-libmspub	git://anongit.freedesktop.org/libreoffice/libmspub
	libreoffice-libs-core	git://anongit.freedesktop.org/libreoffice/libs-core
	libreoffice-libs-extern	git://anongit.freedesktop.org/libreoffice/libs-extern
	libreoffice-libs-extern-sys	git://anongit.freedesktop.org/libreoffice/libs-extern-sys
	libreoffice-libs-gui	git://anongit.freedesktop.org/libreoffice/libs-gui
	libreoffice-libvisio	git://anongit.freedesktop.org/libreoffice/libvisio
	libreoffice-lightproof	git://anongit.freedesktop.org/libreoffice/lightproof
	libreoffice-original-artwork	git://anongit.freedesktop.org/libreoffice/original-artwork
	libreoffice-postprocess	git://anongit.freedesktop.org/libreoffice/postprocess
	libreoffice-sdk	git://anongit.freedesktop.org/libreoffice/sdk
	libreoffice-templates	git://anongit.freedesktop.org/libreoffice/templates
	libreoffice-testing	git://anongit.freedesktop.org/libreoffice/testing
	libreoffice-translations	git://anongit.freedesktop.org/libreoffice/translations
	libreoffice-ugly	git://anongit.freedesktop.org/libreoffice/ugly
	libreoffice-ure	git://anongit.freedesktop.org/libreoffice/ure
	libreoffice-voting	git://anongit.freedesktop.org/libreoffice/voting
	libreoffice-website	git://anongit.freedesktop.org/libreoffice/website
	libreoffice-writer	git://anongit.freedesktop.org/libreoffice/writer
	mesa-clover	git://anongit.freedesktop.org/mesa/clover
	mesa-demos	git://anongit.freedesktop.org/mesa/demos
	mesa-drm	git://anongit.freedesktop.org/mesa/drm
	mesa-glu	git://anongit.freedesktop.org/mesa/glu
	mesa-glut	git://anongit.freedesktop.org/mesa/glut
	mesa-glw	git://anongit.freedesktop.org/mesa/glw
	mesa-lb-mesa	git://people.freedesktop.org/
	mesa-libv-mesa-dri-i9xx	git://people.freedesktop.org/
	mesa-libwsbm	git://anongit.freedesktop.org/mesa/libwsbm
	mesa-linux-agp-compat	git://anongit.freedesktop.org/mesa/linux-agp-compat
	mesa-mareko-mesa	git://people.freedesktop.org/
	mesa-mesa	git://anongit.freedesktop.org/mesa/mesa
	mesa-mesa-test	git://anongit.freedesktop.org/mesa/mesa-test
	mesa-r600_demo	git://anongit.freedesktop.org/mesa/r600_demo
	mesa-rbug-gui	git://anongit.freedesktop.org/mesa/rbug-gui
	mesa-shader-db	git://anongit.freedesktop.org/mesa/shader-db
	mesa-tasks	git://anongit.freedesktop.org/mesa/tasks
	mesa-vmwgfx	git://anongit.freedesktop.org/mesa/vmwgfx
	wayland-libinput	git://anongit.freedesktop.org/wayland/libinput
	wayland-wayland	git://anongit.freedesktop.org/wayland/wayland
	wayland-wayland-web	git://anongit.freedesktop.org/wayland/wayland-web
	wayland-weston	git://anongit.freedesktop.org/wayland/weston
	xorg-app-intel-gpu-tools	git://anongit.freedesktop.org/xorg/app/intel-gpu-tools
	xorg-driver-xf86-video-intel	git://anongit.freedesktop.org/xorg/driver/xf86-video-intel
	xorg-lib-libX11	git://anongit.freedesktop.org/xorg/lib/libX11
	xorg-xserver	git://anongit.freedesktop.org/xorg/xserver
Mozilla	camino	https://hg.mozilla.org/camino/
	chatzilla	https://hg.mozilla.org/chatzilla/
	comm-central	https://hg.mozilla.org/comm-central/
	dom-inspector	https://hg.mozilla.org/dom-inspector/
	graphs	https://hg.mozilla.org/graphs/
	ipccode	https://hg.mozilla.org/ipccode/
	mobile-browser	https://hg.mozilla.org/mobile-browser/
	mozilla-central	https://hg.mozilla.org/mozilla-central/

	penelope	https://hg.mozilla.org/penelope/
	pyxpcom	https://hg.mozilla.org/pyxpcom/
	schema-validation	https://hg.mozilla.org/schema-validation/
	tamarin-redux	http://hg.mozilla.org/tamarin-redux/
	try-comm-central	https://hg.mozilla.org/try-comm-central/
	venkman	https://hg.mozilla.org/venkman/
	xforms	https://hg.mozilla.org/xforms/
NetBeans	community-ruby	http://hg.netbeans.org/community-ruby/
	core-main	http://hg.netbeans.org/core-main/
	ergonomics	http://hg.netbeans.org/ergonomics/
	platformx	http://hg.netbeans.org/platformx/
openoffice	https://github.com/apache/openoffice.git	
Gentoo	portage	git://git.overlays.gentoo.org/proj/portage.git
	kde	git://git.overlays.gentoo.org/proj/kde.git
	sunrise-reviewed	git://git.overlays.gentoo.org/proj/sunrise-reviewed.git
	sci	git://git.overlays.gentoo.org/proj/sci.git
	portage-multirepo	git://git.overlays.gentoo.org/proj/portage-multirepo.git
	portage-idfetch	git://git.overlays.gentoo.org/proj/portage-idfetch.git
	gnome	git://git.overlays.gentoo.org/proj/gnome.git
	xserver	git://git.overlays.gentoo.org/proj/xserver.git
	perl-overlay	git://git.overlays.gentoo.org/proj/perl-overlay.git
	java	git://git.overlays.gentoo.org/proj/java.git
	qt	git://git.overlays.gentoo.org/proj/qt.git
	java-experimental	git://git.overlays.gentoo.org/proj/java-experimental.git
	openrc	git://git.overlays.gentoo.org/proj/openrc.git
	lisp	git://git.overlays.gentoo.org/proj/lisp.git
	hardened-refpolicy	git://git.overlays.gentoo.org/proj/hardened-refpolicy.git
	multilib-portage	git://git.overlays.gentoo.org/proj/multilib-portage.git
	kde-crazy	git://git.overlays.gentoo.org/proj/kde-crazy.git
	x11	git://git.overlays.gentoo.org/proj/x11.git
	keruspe	git://git.overlays.gentoo.org/user/keruspe.git
	quagga	git://git.overlays.gentoo.org/proj/quagga.git
	sparse	git://git.overlays.gentoo.org/proj/sparse.git
	gli	git://git.overlays.gentoo.org/proj/gli.git
	catalyst	git://git.overlays.gentoo.org/proj/catalyst.git
	emacs	git://git.overlays.gentoo.org/proj/emacs.git
	genkernel	git://git.overlays.gentoo.org/proj/genkernel.git
	graaff	git://git.overlays.gentoo.org/dev/graaff.git
	gmt	git://git.overlays.gentoo.org/user/gmt.git
	mozilla	git://git.overlays.gentoo.org/proj/mozilla.git
	R_overlay	git://git.overlays.gentoo.org/proj/R_overlay.git
	releng	git://git.overlays.gentoo.org/proj/releng.git
	gamerlay	git://git.overlays.gentoo.org/proj/gamerlay.git
	dilfridge	git://git.overlays.gentoo.org/dev/dilfridge.git
	enlightenment	git://git.overlays.gentoo.org/proj/enlightenment.git
	portage-utils	git://git.overlays.gentoo.org/proj/portage-utils.git
	lxc	git://git.overlays.gentoo.org/proj/lxc.git
	hardened-dev	git://git.overlays.gentoo.org/proj/hardened-dev.git
	blueness	git://git.overlays.gentoo.org/dev/blueness.git
	voip	git://git.overlays.gentoo.org/proj/voip.git
	dev-zero	git://git.overlays.gentoo.org/dev/dev-zero.git
	bircoph	git://git.overlays.gentoo.org/user/bircoph.git
	dberkholz	git://git.overlays.gentoo.org/dev/dberkholz.git
	betagarden	git://git.overlays.gentoo.org/proj/betagarden.git
	toolchain	git://git.overlays.gentoo.org/proj/toolchain.git
	embedded-cross	git://git.overlays.gentoo.org/proj/embedded-cross.git
	overlay	git://git.overlays.gentoo.org/dev/wrobel/overlay.git
	eselect	git://git.overlays.gentoo.org/proj/eselect.git
	jokey	git://git.overlays.gentoo.org/dev/jokey.git
	desktop-effects	git://git.overlays.gentoo.org/proj/desktop-effects.git

sandbox	git://git.overlays.gentoo.org/proj/sandbox.git
planet-gentoo	git://git.overlays.gentoo.org/proj/planet-gentoo.git
mv	git://git.overlays.gentoo.org/user/mv.git
fordfrog	git://git.overlays.gentoo.org/dev/fordfrog.git
www-redesign	git://git.overlays.gentoo.org/proj/www-redesign.git
flameeyes	git://git.overlays.gentoo.org/dev/flameeyes.git
mysql	git://git.overlays.gentoo.org/proj/mysql.git
libbash	git://git.overlays.gentoo.org/proj/libbash.git
xfce	git://git.overlays.gentoo.org/proj/xfce.git
mrueg	git://git.overlays.gentoo.org/user/mrueg.git
devel	git://git.overlays.gentoo.org/proj/vdr/devel.git
glsamaker	git://git.overlays.gentoo.org/proj/glsamaker.git
aballier	git://git.overlays.gentoo.org/dev/aballier.git
vmware	git://git.overlays.gentoo.org/proj/vmware.git
ikelos	git://git.overlays.gentoo.org/dev/ikelos.git
mgorny	git://git.overlays.gentoo.org/dev/mgorny.git
gentoolkit	git://git.overlays.gentoo.org/proj/gentoolkit.git
ruby-overlay	git://git.overlays.gentoo.org/proj/ruby-overlay.git
pms	git://git.overlays.gentoo.org/proj/pms.git
eroen	git://git.overlays.gentoo.org/user/eroen.git
pva	git://git.overlays.gentoo.org/dev/pva.git
java-config	git://git.overlays.gentoo.org/proj/java-config.git
hardened-patchset	git://git.overlays.gentoo.org/proj/hardened-patchset.git
hardened-docs	git://git.overlays.gentoo.org/proj/hardened-docs.git
layman	git://git.overlays.gentoo.org/proj/layman.git
luman	git://git.overlays.gentoo.org/user/luman.git
gentoo-vdr-scripts	git://git.overlays.gentoo.org/proj/gentoo-vdr-scripts.git
testing	git://git.overlays.gentoo.org/proj/vdr/testing.git
gentoo-bsd	git://git.overlays.gentoo.org/proj/gentoo-bsd.git
mysql-extras	git://git.overlays.gentoo.org/proj/mysql-extras.git
gitolite-gentoo	git://git.overlays.gentoo.org/proj/gitolite-gentoo.git
xmw	git://git.overlays.gentoo.org/dev/xmw.git
net-tools	git://git.overlays.gentoo.org/proj/net-tools.git
gentoopm	git://git.overlays.gentoo.org/proj/gentoopm.git
gentoo-packages	git://git.overlays.gentoo.org/proj/gentoo-packages.git
devmanual	git://git.overlays.gentoo.org/proj/devmanual.git
scarabeus	git://git.overlays.gentoo.org/dev/scarabeus.git
misc	git://git.overlays.gentoo.org/proj/vps/misc.git
pms-test-suite	git://git.overlays.gentoo.org/proj/pms-test-suite.git
palmer	git://git.overlays.gentoo.org/user/palmer.git
scire	git://git.overlays.gentoo.org/proj/scire.git
suka	git://git.overlays.gentoo.org/dev/suka.git
je_fro	git://git.overlays.gentoo.org/dev/je_fro.git
gentoo-doc-translations	git://git.overlays.gentoo.org/proj/gentoo-doc-translations.git
loongson	git://git.overlays.gentoo.org/proj/loongson.git
elfix	git://git.overlays.gentoo.org/proj/elfix.git
kde-sunset	git://git.overlays.gentoo.org/proj/kde-sunset.git
DuPol	git://git.overlays.gentoo.org/user/DuPol.git
g-octave	git://git.overlays.gentoo.org/proj/g-octave.git
g-sorcery	git://git.overlays.gentoo.org/proj/g-sorcery.git
anaconda	git://git.overlays.gentoo.org/proj/anaconda.git
alexxy	git://git.overlays.gentoo.org/dev/alexxy.git
srcshelton	git://git.overlays.gentoo.org/user/srcshelton.git
benf	git://git.overlays.gentoo.org/user/benf.git
apache	git://git.overlays.gentoo.org/proj/apache.git
matsuu	git://git.overlays.gentoo.org/dev/matsuu.git
maekke	git://git.overlays.gentoo.org/dev/maekke.git
improvise	git://git.overlays.gentoo.org/user/improvise.git
systemd	git://git.overlays.gentoo.org/user/systemd.git
ltsp	git://git.overlays.gentoo.org/proj/ltsp.git
ufed	git://git.overlays.gentoo.org/proj/ufed.git

	sattvik	git://git.overlays.gentoo.org/user/sattvik.git
	livecd-tools	git://git.overlays.gentoo.org/proj/livecd-tools.git
	ruby-scripts	git://git.overlays.gentoo.org/proj/ruby-scripts.git
	overlord	git://git.overlays.gentoo.org/proj/overlord.git
	ultrabug	git://git.overlays.gentoo.org/dev/ultrabug.git
	sardemff7	git://git.overlays.gentoo.org/user/sardemff7.git
	jmbsvicetto	git://git.overlays.gentoo.org/dev/jmbsvicetto.git
	wolf31o2	git://git.overlays.gentoo.org/dev/wolf31o2.git
	gentoo-bugzilla	git://git.overlays.gentoo.org/proj/gentoo-bugzilla.git
	kernel-check	git://git.overlays.gentoo.org/proj/kernel-check.git
Fedora	NetworkManager.git	git://pkgs.fedoraproject.org/NetworkManager.git/
	PackageKit.git	git://pkgs.fedoraproject.org/PackageKit.git/
	amarok.git	git://pkgs.fedoraproject.org/amarok.git/
	anaconda.git	git://pkgs.fedoraproject.org/anaconda.git/
	audit.git	git://pkgs.fedoraproject.org/audit.git/
	autofs.git	git://pkgs.fedoraproject.org/autofs.git/
	bacula.git	git://pkgs.fedoraproject.org/bacula.git/
	bash.git	git://pkgs.fedoraproject.org/bash.git/
	bind.git	git://pkgs.fedoraproject.org/bind.git/
	binutils.git	git://pkgs.fedoraproject.org/binutils.git/
	cinnamon.git	git://pkgs.fedoraproject.org/cinnamon.git/
	cobbler.git	git://pkgs.fedoraproject.org/cobbler.git/
	compiz.git	git://pkgs.fedoraproject.org/compiz.git/
	control-center.git	git://pkgs.fedoraproject.org/control-center.git/
	coreutils.git	git://pkgs.fedoraproject.org/coreutils.git/
	cups.git	git://pkgs.fedoraproject.org/cups.git/
	curl.git	git://pkgs.fedoraproject.org/curl.git/
	dhcp.git	git://pkgs.fedoraproject.org/dhcp.git/
	digikam.git	git://pkgs.fedoraproject.org/digikam.git/
	dovecot.git	git://pkgs.fedoraproject.org/dovecot.git/
	eclipse.git	git://pkgs.fedoraproject.org/eclipse.git/
	emacs.git	git://pkgs.fedoraproject.org/emacs.git/
	empathy.git	git://pkgs.fedoraproject.org/empathy.git/
	epiphany.git	git://pkgs.fedoraproject.org/epiphany.git/
	erlang.git	git://pkgs.fedoraproject.org/erlang.git/
	evince.git	git://pkgs.fedoraproject.org/evince.git/
	evolution-data-server.git	git://pkgs.fedoraproject.org/evolution-data-server.git/
	evolution.git	git://pkgs.fedoraproject.org/evolution.git/
	file-roller.git	git://pkgs.fedoraproject.org/file-roller.git/
	firefox.git	git://pkgs.fedoraproject.org/firefox.git/
	foomatic.git	git://pkgs.fedoraproject.org/foomatic.git/
	gcc.git	git://pkgs.fedoraproject.org/gcc.git/
	gdb.git	git://pkgs.fedoraproject.org/gdb.git/
	gdm.git	git://pkgs.fedoraproject.org/gdm.git/
	gedit.git	git://pkgs.fedoraproject.org/gedit.git/
	ghc.git	git://pkgs.fedoraproject.org/ghc.git/
	ghostscript.git	git://pkgs.fedoraproject.org/ghostscript.git/
	gimp.git	git://pkgs.fedoraproject.org/gimp.git/
	glib2.git	git://pkgs.fedoraproject.org/glib2.git/
	glibc.git	git://pkgs.fedoraproject.org/glibc.git/
	gnome-applets.git	git://pkgs.fedoraproject.org/gnome-applets.git/
	gnome-games.git	git://pkgs.fedoraproject.org/gnome-games.git/
	gnome-panel.git	git://pkgs.fedoraproject.org/gnome-panel.git/
	gnome-screensaver.git	git://pkgs.fedoraproject.org/gnome-screensaver.git/
	gnome-session.git	git://pkgs.fedoraproject.org/gnome-session.git/
	gnome-settings-daemon.git	git://pkgs.fedoraproject.org/gnome-settings-daemon.git/
	gnome-shell.git	git://pkgs.fedoraproject.org/gnome-shell.git/
	grub2.git	git://pkgs.fedoraproject.org/grub2.git/
	gtk2.git	git://pkgs.fedoraproject.org/gtk2.git/
	gvfs.git	git://pkgs.fedoraproject.org/gvfs.git/
	hplip.git	git://pkgs.fedoraproject.org/hplip.git/

httpd.git	git://pkgs.fedoraproject.org/httpd.git/
ibus.git	git://pkgs.fedoraproject.org/ibus.git/
initscripts.git	git://pkgs.fedoraproject.org/initscripts.git/
jd.git	git://pkgs.fedoraproject.org/jd.git/
kde-l10n.git	git://pkgs.fedoraproject.org/kde-l10n.git/
kde-workspace.git	git://pkgs.fedoraproject.org/kde-workspace.git/
kdeadmin.git	git://pkgs.fedoraproject.org/kdeadmin.git/
kdebase-runtime.git	git://pkgs.fedoraproject.org/kdebase-runtime.git/
kdebase-workspace.git	git://pkgs.fedoraproject.org/kdebase-workspace.git/
kdebase.git	git://pkgs.fedoraproject.org/kdebase.git/
kdebindings.git	git://pkgs.fedoraproject.org/kdebindings.git/
kdeedu.git	git://pkgs.fedoraproject.org/kdeedu.git/
kdegames.git	git://pkgs.fedoraproject.org/kdegames.git/
kdegraphics.git	git://pkgs.fedoraproject.org/kdegraphics.git/
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kdemultimedia.git	git://pkgs.fedoraproject.org/kdemultimedia.git/
kdenetwork.git	git://pkgs.fedoraproject.org/kdenetwork.git/
kdepim.git	git://pkgs.fedoraproject.org/kdepim.git/
kdepimlibs.git	git://pkgs.fedoraproject.org/kdepimlibs.git/
kdesdk.git	git://pkgs.fedoraproject.org/kdesdk.git/
kdeutils.git	git://pkgs.fedoraproject.org/kdeutils.git/
kernel.git	git://pkgs.fedoraproject.org/kernel.git/
kexec-tools.git	git://pkgs.fedoraproject.org/kexec-tools.git/
krb5.git	git://pkgs.fedoraproject.org/krb5.git/
libguestfs.git	git://pkgs.fedoraproject.org/libguestfs.git/
libreoffice.git	git://pkgs.fedoraproject.org/libreoffice.git/
libselinux.git	git://pkgs.fedoraproject.org/libselinux.git/
libvirt.git	git://pkgs.fedoraproject.org/libvirt.git/
lvm2.git	git://pkgs.fedoraproject.org/lvm2.git/
mesa.git	git://pkgs.fedoraproject.org/mesa.git/
mkinitrd.git	git://pkgs.fedoraproject.org/mkinitrd.git/
nautilus.git	git://pkgs.fedoraproject.org/nautilus.git/
net-snmp.git	git://pkgs.fedoraproject.org/net-snmp.git/
nfs-utils.git	git://pkgs.fedoraproject.org/nfs-utils.git/
nss.git	git://pkgs.fedoraproject.org/nss.git/
openldap.git	git://pkgs.fedoraproject.org/openldap.git/
openoffice.org.git	git://pkgs.fedoraproject.org/openoffice.org.git/
openssh.git	git://pkgs.fedoraproject.org/openssh.git/
openssl.git	git://pkgs.fedoraproject.org/openssl.git/
pam.git	git://pkgs.fedoraproject.org/pam.git/
perl.git	git://pkgs.fedoraproject.org/perl.git/
php.git	git://pkgs.fedoraproject.org/php.git/
policycoreutils.git	git://pkgs.fedoraproject.org/policycoreutils.git/
python.git	git://pkgs.fedoraproject.org/python.git/
qbittorrent.git	git://pkgs.fedoraproject.org/qbittorrent.git/
qemu.git	git://pkgs.fedoraproject.org/qemu.git/
qt.git	git://pkgs.fedoraproject.org/qt.git/
redhat-rpm-config.git	git://pkgs.fedoraproject.org/redhat-rpm-config.git/
rhythmbox.git	git://pkgs.fedoraproject.org/rhythmbox.git/
rpm.git	git://pkgs.fedoraproject.org/rpm.git/
ruby.git	git://pkgs.fedoraproject.org/ruby.git/
samba.git	git://pkgs.fedoraproject.org/samba.git/
selinux-policy.git	git://pkgs.fedoraproject.org/selinux-policy.git/
setroubleshoot.git	git://pkgs.fedoraproject.org/setroubleshoot.git/
squid.git	git://pkgs.fedoraproject.org/squid.git/
subversion.git	git://pkgs.fedoraproject.org/subversion.git/
system-config-printer.git	git://pkgs.fedoraproject.org/system-config-printer.git/
systemd.git	git://pkgs.fedoraproject.org/systemd.git/
systemtap.git	git://pkgs.fedoraproject.org/systemtap.git/
thunderbird.git	git://pkgs.fedoraproject.org/thunderbird.git/
totem.git	git://pkgs.fedoraproject.org/totem.git/

	udev.git	git://pkgs.fedoraproject.org/udev.git/	
	vim.git	git://pkgs.fedoraproject.org/vim.git/	
	wine.git	git://pkgs.fedoraproject.org/wine.git/	
	xen.git	git://pkgs.fedoraproject.org/xen.git/	
	xorg-x11-drv-ati.git	git://pkgs.fedoraproject.org/xorg-x11-drv-ati.git/	
	xorg-x11-server.git	git://pkgs.fedoraproject.org/xorg-x11-server.git/	
	xulrunner.git	git://pkgs.fedoraproject.org/xulrunner.git/	
	yum.git	git://pkgs.fedoraproject.org/yum.git/	