

Fedora 19

Release Notes

Release Notes for Fedora 19



Edited by
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Abstract

This document provides the release notes for Fedora 19. It describes major changes offered in the Schrödinger's Cat as compared to Fedora 18. For a detailed listing of all changes, refer to the Fedora Technical Notes.

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1. Welcome to Fedora 19

1.1. Welcome to Fedora

You can help the Fedora Project community continue to improve Fedora if you file bug reports and enhancement requests. Refer to [Bugs And Feature Requests](#), on the Fedora wiki, for more information about bug and feature reporting. Thank you for your participation.

To find out more general information about Fedora, refer to the following pages, on the Fedora wiki (<http://fedoraproject.org/wiki/>):

- » [Fedora Overview](#)
- » [Fedora FAQ](#)
- » [Help and Discussions](#)
- » [Participate in the Fedora Project](#)

1.1.1. Need Help?

There are a number of places you can get assistance should you run into problems.

If you run into a problem and would like some assistance, go to <http://ask.fedoraproject.org>. Many answers are already there, but if you don't find yours, you can simply post a new question. This has the advantage that anyone else with the same problem can find the answer, too.

You may also find assistance on the **#fedora** channel on the IRC net **irc.freenode.net**. Keep in mind that the channel is populated by volunteers wanting to help, but folks knowledgeable about a specific topic might not always be available.

1.2. Overview

As always, Fedora continues to develop ([Red Hat contributions](#)) and integrate the latest free and open source software ([Fedora 19 Features](#)). The following sections provide a brief overview of major changes from the last release of Fedora.

For more details about the features that are included in Fedora 19 refer to the individual wiki pages that detail feature goals and progress: <http://fedoraproject.org/wiki/Releases/19/FeatureList>.

1.3. Hardware Overview

Fedora 19 provides software to suit a wide variety of applications. The storage, memory and processing requirements vary depending on usage. For example, a high traffic database server requires much more memory and storage than a business desktop, which in turn has higher requirements than a single-purpose virtual machine.

1.3.1. Minimum System Configuration

The figures below are a recommended minimum for the default installation. Your requirements may differ, and most applications will benefit from more than the minimum resources.

1GHz or faster processor
1GB System Memory
10GB unallocated drive space

Low memory installations

Fedora 19 can be installed and used on systems with limited resources for some applications. Text, vnc, or kickstart installations are advised over graphical installation for systems with very low memory. Larger package sets require more memory during installation, so users with less than 768MB of system memory may have better results performing a minimal install and adding to it afterward. For best results on systems with less than 1GB of memory, use the DVD installation image.

1.3.2. Graphics Hardware

1.3.2.1. Minimum Hardware for Accelerated Desktops

Fedora 19 supports most display adapters. Modern, feature-rich desktop environments like GNOME3 and KDE Plasma Workspaces use video devices to provide 3D-accelerated desktops. Older graphics hardware may *not support* acceleration:

Intel prior to GMA9xx
NVIDIA prior to NV30 (GeForce FX5xx series)
Radeon prior to R300 (Radeon 9500)

1.3.2.2. CPU Accelerated Graphics

Systems with older or no graphics acceleration devices can have accelerated desktop environments using LLVMpipe technology, which uses the CPU to render graphics. LLVMpipe requires a processor with SSE2 extensions. The extensions supported by your processor are listed in the **flags:** section of **/proc/cpuinfo**

1.3.2.3. Choosing a Desktop Environment for your hardware

Fedora 19's default desktop environment, GNOME3, functions best with hardware acceleration. Alternative desktops are recommended for users with older graphics hardware or those seeing insufficient performance with LLVMpipe.

Desktop environments can be added to an existing installation and selected at login. To list the available desktops, use the **yum grouplist** command:

```
yum grouplist -v hidden | grep desktop
```

Install the desired group:

```
yum groupinstall "KDE Plasma Workspaces"
```

Or, use the short group name to install:

```
yum install @mate-desktop-environment
```

1.4. Feedback

Thank you for taking the time to provide your comments, suggestions, and bug reports to the Fedora community; this helps improve the state of Fedora, Linux, and free software worldwide.

1.4.1. Providing Feedback on Fedora Software

To provide feedback on Fedora software or other system elements, please refer to [Bugs And Feature Requests](#). A list of commonly reported bugs and known issues for this release is available from [Common F19 bugs](#), on the wiki.

1.4.2. Providing Feedback on Release Notes

If you feel these release notes could be improved in any way, you can provide your feedback directly to the beat writers. There are several ways to provide feedback, in order of preference:

- » If you have a Fedora account, edit content directly at [Docs-Beats](#) page on the wiki.
- » Fill out a bug request using [this template](#) - This link is *ONLY* for feedback on the release notes themselves. Refer to the admonition above for details.
- » E-mail the Release-Note mailing list at relnotes@fedoraproject.org

2. Changes in Fedora for System Administrators

2.1. Kernel

Fedora 19 features the 3.9.0 kernel.

2.2. Installation

2.2.1. Minimum Screen Resolution

Graphical Installation requires 800x600 resolution or higher

Graphical installation of Fedora 19 requires a minimum screen resolution of 800x600. Owners of devices with lower resolution, such as some netbooks, should use text or VNC installation. Once installed, Fedora will support these lower resolution devices. The minimum resolution requirement applies only to graphical installation.

2.2.2. Syslinux

Fedora 19 includes an option for using the **Extlinux** bootloader, part of the *Syslinux* family of bootloaders. This bootloader is not as advanced as the default **Grub2** bootloader and will not work in all circumstances. The target use-case for F19 is lightweight cloud images, but you may find Extlinux useful in other situations as well.

Currently, Extlinux does not support LVM, and while it does support btrfs, that support is limited. An ext2, ext3, or ext4 filesystem is required, as either the root filesystem or a small standalone /boot partition. Additionally, currently only X86 architectures are supported.

To enable Extlinux, either use the **extlinux** keyword on the Anaconda command line, or use the "--extlinux" flag for the bootloader command in kickstart. This feature is not made visible in the installer's graphical or text-mode user interfaces.

Syslinux is not preferable to grub for most end users!

This support is currently targeted at a narrow use case, primarily virtual machines, and Extlinux will not work for all situations in Fedora 19.

2.2.3. Firstboot configuration

Initial setup screens have been revamped for Fedora 19. **GNOME** now offers user creation and configuration at first boot. Other environments will instead use the new functionality from the installer.

2.2.4. Remote Authentication support is limited

The Fedora 19 installer does not currently support configuration of remote authentication during installation. However, if GNOME is being installed and no users are created by the installer, the first boot of GNOME will provide a user creation dialog that supports FreeIPA and AD.

Users requiring remote authentication under other use cases should configure it in a kickstart file or after the installation is complete.

2.2.5. Advanced Storage

The rewrite of the *anaconda* installer begun in Fedora 18 continues. Fedora 19 provides support during installation for advanced storage, such as **fcoe**, **iscsi**, and **multipath**. The text mode of the installer has also been improved.

2.2.6. AD domain integration

Fedora can now join a domain from a kickstart file or from the *anaconda*, using one time passwords and a simple syntax.

```
# example kickstart lines to join realm:  
network --hostname=machine.ad.example.com  
realm join --one-time-password=MyPassword ad.example.com
```

2.3. Boot

2.3.1. Faster Boot with host only initramfs.

Rescue and Rebuild for major changes

Boot speed is improved by removing unused features from the initramfs. If new hardware is added, boot into the rescue initramfs and use the command **dracut --regenerate-all --force** to rebuild and replace the old initramfs.

This Fedora release builds an initramfs tailored especially for your computer hardware, allowing faster boot. If you change your machine or significant hardware, you might have to boot with the **Rescue** boot entry and execute **dracut --**

regenerate-a11. If you want your initramfs to be hardware independent, install the *dracut-nohostname* rpm package. If you don't want rescue images at all (like in virtual machines), install the *dracut-norescue* rpm package.

2.3.2. Visual Changes to GRUB

The appearance of *GRUB* and GRUB menus have been changed to present a more seamless, appealing look.

2.4. Security

2.4.1. Hardlink and symlink restrictions

A long-standing class of security issues is the link based time-of-check-time-of-use race, most commonly seen in world writable directories like */tmp*. The common method of exploitation of this flaw is to cross privilege boundaries when following a given link, such as when a root process follows a link belonging to another user. In Fedora 19, we permit links to only be followed when outside a stickyworld-writable directory, or when the uid of the link and follower match, or when the directory owner matches the link's owner. In previous releases, this was enforced by **SELinux** policy and in this release, the restrictions are enabled by **sysctl** settings in */usr/lib/sysctl.d/00-system.conf* as an additional layer of protection:

```
fs.protected_hardlinks = 1
fs.protected_symlinks = 1
```

Refer to <http://lwn.net/Articles/503660/> and <https://git.kernel.org/cgit/linux/kernel/git/torvalds/linux.git/commit/?id=800179c9b8a1e796e441674776d11cd4c05d61d7> for more detailed information about this change.

2.4.2. Shared System Certificates

Root anchored certificate authorities are consumed from single location and shared by most applications, unless those applications are explicitly configured with other certificates.

A system administrator can now place a non-standard certificate authority to be a trusted root as a file in a directory location. After running a tool, it will be used by most applications as expected, except those otherwise configured.

For implementation details, read <http://fedoraproject.org/wiki/Features/SharedSystemCertificates:Testing>.

2.4.3. FreeIPA

2.4.3.1. FreeIPA realmd support

It is now possible to simply configure a client to use a FreeIPA domain for authentication by using the **GNOME Control Center**, **kickstart** or command line:

```
realm join myipadomain.com
```

2.4.3.2. FreeIPA Trust Improvements

When using **FreeIPA** to trust Active Directory domain, it is now possible to designate multiple domain controllers in **FreeIPA** to server Windows clients.

FreeIPA has added management of additional domain suffixes visible to the trusted Active Directory domain's clients.

FreeIPA now implements **Global Catalog** service to allow Active Directory domain administrators to **FreeIPA** users.

Documentation of these new features is available at <http://www.freeipa.org/page/V3/MultipleTrustServers> and <https://fedorahosted.org/sssd/wiki/DesignDocs/GlobalCatalogLookups>.

2.4.4. SSSD improves AD integration

With the latest major release to **SSSD** the integration into Active Directory domains has been improved. AD sites are respected and SSSD tries to access the nearest domain controller. Users and groups from trusted domains are available.

2.4.5. More resilient Kerberos

Kerberos in Fedora 19 has been improved. It is now possible to authenticate using **kerberos** regardless of the local system time being in sync with that of the **kerberos** server.

Various **kerberos** bugs, including handling of reverse DNS records, have been fixed in order to make a more seamless **kerberos** experience.

2.4.6. gssproxy

Fedora 19 features *gssproxy*, an opensource project that aims to improve **GSSAPI** usage from both the kernel for authenticating remote file system access as well as user-space applications. It does provide fine-grained access control on **Kerberos** keytab access and it overcomes various limitations the kernel had when dealing with Kerberos tickets.

2.5. Virtualization

2.5.1. open-vm-tools

open-vm-tools, the open source implementation of VMware Tools, is now available from Fedora.

2.5.2. High Availability container resources

Pacemaker now supports the ability to manage resources remotely on non-cluster nodes through the use of the **pacemaker_remote** service. This feature allows **pacemaker** to manage both virtual guests and the resources that live within the guests all from the host cluster node without requiring the guest nodes to run the cluster stack.

View <http://clusterlabs.org/doc/> and the usage summary at http://fedoraproject.org/wiki/Features/High_Availability_Container_Resources for more information.

2.5.3. Virt Storage Migration

KVM and **libvirt** now support a performant way to live migrate virtual machines with no shared storage between the hosts. A running VM and its disk images are relocated to a new machine with no downtime.

For more information, read:

<http://wiki.qemu.org/Features/LiveBlockMigration>
<http://wiki.qemu.org/Features/LiveBlockMigration/ImageStreamingAPI>
<https://www.redhat.com/archives/libvir-list/2013-February/msg00277.html>

2.5.4. Virtio Random Number Generator

KVM and **libvirt** now support a paravirtual random number generator device. This can be used to prevent entropy starvation in virtual machines.

These links document and explain Virtio RNG:

<http://wiki.qemu-project.org/Features/VirtIORNG>
<https://lists.gnu.org/archive/html/qemu-devel/2012-05/msg02235.html>
<https://www.redhat.com/archives/libvir-list/2013-January/msg00775.html>
<https://www.redhat.com/archives/libvir-list/2012-December/msg00937.html>
<http://egd.sourceforge.net/>
<http://log.amitshah.net/2013/01/about-random-numbers-and-virtual-machines/>
<https://wn.net/Articles/525459/>

2.6. Web Servers

2.7. Cloud

2.7.1. Ready-to-run cloud images

Ready-to-run cloud images are provided as part of Fedora 19. These are available in Amazon EC2 or for direct download. The downloadable images are available in compressed raw image format and in qcow2 for immediate use with EC2, OpenStack, CloudStack, or Eucalyptus. The images are configured with cloud-init, and so will take advantage of ec2-compatible metadata services for provisioning SSH keys.

2.7.2. OpenShift Origin

OpenShift Origin, the community-supported version of Red Hat's OpenShift, is available for the first time in Fedora 19.

2.7.3. OpenStack Grizzly

OpenStack is upgraded to the latest stable release, code named "Grizzly". OpenStack Grizzly includes the Incubation projects Heat and Ceilometer, as well as numerous other upgrades and improvements. A detailed list of changes is available at <https://wiki.openstack.org/wiki/ReleaseNotes/Grizzly>

Several subprojects are also available, as noted below.

2.7.3.1. Ceilometer

This OpenStack incubation project is new in this release. Please refer to [Ceilometer preliminary setup notes](#).

2.7.3.2. Heat

This OpenStack incubation project is new in this release. Please visit [Heat preliminary setup notes](#)

2.7.3.3. Nova

Nova volumes removed in favor of **cinder**, refer to <https://blueprints.launchpad.net/nova/+spec/delete-nova-volume>

Compute nodes no longer access the database to support greater scalability and security, refer to <https://blueprints.launchpad.net/nova/+spec/no-db-compute>

Snapshots can be done to block devices as well as **qcow2** files, refer to <https://blueprints.launchpad.net/nova/+spec/snapshots-for-everyone>

compute cells was merged to support greater scalability, refer to <https://blueprints.launchpad.net/nova/+spec/nova-compute-cells>

libvirt now supports **SPICE** as well as **VNC**, refer to <https://blueprints.launchpad.net/nova/+spec/libvirt-spice>

2.7.3.4. Quantum

Security groups are now supported, details may be found at <https://blueprints.launchpad.net/quantum/+spec/quantum-security-groups>

2.7.3.5. Cinder

Volume backup to **swift** is now available, visit <https://blueprints.launchpad.net/cinder/+spec/volume-backups>

LIO iSCSI target support, refer to <https://blueprints.launchpad.net/cinder/+spec/lio-iscsi-support>

2.7.3.6. Keystone

A new **V3** API has been implemented, details at <https://blueprints.launchpad.net/keystone/+spec/implement-v3-core-api>

A new **LDAP** backend has been introduced, learn more at <https://blueprints.launchpad.net/keystone/+spec/ad-ldap-identity-backend>

2.7.3.7. Horizon

File uploads have been improved, refer to <https://blueprints.launchpad.net/horizon/+spec/file-upload-redux>

Unified config has been implemented to simplify administration, visit <https://blueprints.launchpad.net/horizon/+spec/unify-config>

A system info panel was added, refer to <https://blueprints.launchpad.net/horizon/+spec/system-info-panel>

2.8. Database Servers

2.8.1. MariaDB

Fedora 19 features *MariaDB*, an improved and more open fork of MySQL with a thriving community. *MariaDB* is used as the default mysql compatible database, and the change should be transparent to almost all MySQL users. If required, the original MySQL packages are still available as *community-mysql*.

To learn more about migrating to MariaDB, read <https://kb.askmonty.org/en/mariadb-versus-mysql-features/> and <https://kb.askmonty.org/en/mariadb-versus-mysql-compatibility/>.

2.8.2. Derby

Apache *Derby*, an open source relational database implemented entirely in Java, has been updated to version 10.9.1.0. For detailed information on the changes to *Derby*, consult the project's website at <http://db.apache.org/derby/>

2.8.3. sqlite

The functionality of *sqlite* has been expanded and improved with the update to version 3.7.15. The project provides a release history at <http://www.sqlite.org/changes.html>

2.9. File Servers

2.9.1. NFS Test

Fedora 19 offers *NFS Test*, a suite of tools for testing NFS clients and services. Detailed information is available at <http://wiki.linux-nfs.org/wiki/index.php/NFSstest>

2.10. System Daemons

2.10.1. Private Temporary Directories available

Services with a PrivateTmp= directory defined in their configuration make use of a private temporary directory that is shared by all processes of the service. These temporary files are deleted when the service is stopped.

2.10.2. systemd

2.10.2.1. Modular service configuration with drop-in files

systemd will now look for configuration directives for a service as `/etc/systemd/system/foo.service.d/bar.conf`, making site-specific changes easier to organize and deploy.

2.10.2.2. systemd lightweight containers

nspawn containers have been improved in order to allow installation an unmodified Fedora distribution for testing, debugging, and development.

2.10.2.3. systemd Message Catalog

The *systemd* Message Catalog uses globally-unique message identifiers to tie specific error messages to additional information such as comprehensive explanations and links to further information.

2.10.2.4. systemd Resource Control

In Fedora 19, *systemd* adds the ability to dynamically modify cgroups-based resource control for services.

2.10.2.5. *systemd* timers

systemd adds support for calendar time events, in addition to existing support for monotonic time events.

2.10.2.6. *systemd-analyze*

systemd-analyze can now use the **GraphViz dot** tool to generate graphs of the boot process. **GraphViz** can be installed with **yum install graphviz** and will create a representation of the full boot process with **systemd-analyze dot | dot -Tsvg > systemd.svg** More refined plots can be generated with the optional arguments **--order**, **--require**, **--from-pattern=**, and **--to-pattern=**

For more details and examples, refer to **man 1 systemd-analyze**.

2.10.2.7. Socket tools

systemd now provides some tools for working with socket units:

systemctl list-sockets to show the sockets *systemd* is listening on, the socket units they belong to, and the units they activate.

systemd-activate to test socket activation.

2.10.2.8. Changes in the journal

Journal files are now owned by the dedicated "systemd-journal" group instead of the 'adm' group.

Changes to **journalctl** usage include:

journalctl -r to see newest entries first.

journalctl -e to skip to the end of the list.

journalctl --user-unit="foo" to filter by user units

A new module in the **systemd** python API for reading the journal

journalctl now persistently stores journal log data in **/var/log/journal**. In previous releases, journal data was stored in **/var/run/journal**, which is volatile and cleared on reboot. Starting with Fedora 19, journal data persists between reboots.

2.11. Server Configuration Tools

2.11.1. *yum-presto* merged into *yum*

The *yum-presto* plugin, used for handling delta RPM files, has been merged into *yum*. To disable use of delta RPM packages, set **deltarpm=0** in **/etc/yum.conf**. Refer to **man yum.conf** for more details.

2.11.2. Yum-enabled LVM snapshots

By using the *yum-plugin-fs-snapshot* package, thinly provisioned LVM filesystems can be automatically snapshot on package updates.

Existing thinly provisioned volumes are required. Snapshotting is enabled in the plugin's configuration file at **/etc/yum/pluginconf.d/fs-snapshot.conf**:

Set **enabled=1** in the **[lvm]** section to enable.

set **create_snapshots_in_post=1** in the **[main]** section to create a snapshot after the yum transaction.

2.11.3. Yum groups as objects

By handling package groups as objects rather than static lists, package managers like *yum* will now store the information and use it for later group related commands, and updates will automatically bring in new packages added to the group.

2.11.4. Easier Administration with *OpenLMI*

The OpenLMI infrastructure has been greatly improved. A new storage API and providers for monitoring, hardware information, realmd, and firewall have been added. Improvements have also been made in the existing providers. Packaged documentation has been updated to reflect the new features.

2.12. Monitoring and Management Solutions

2.12.1. Performance Co-Pilot

Performance Co-Pilot, a framework and suite of servers for system-level performance monitoring and management, has been updated to version 3.7. Consult the project's release notes at <http://oss.sgi.com/projects/pcp/news.html> and their documentation at <http://oss.sgi.com/projects/pcp/pcp-gui.git/man/html/index.html>

2.12.2. Puppet

Fedora 19 ships the 3.x series of the popular *puppet* toolkit. For details on puppet 3, consult the project's documentation at http://docs.puppetlabs.com/puppet3/reference/release_notes.html

3. Changes in Fedora for Desktop Users

3.1. Desktop

3.1.1. Cinnamon

The latest release of the popular desktop environment Cinnamon brings new features and polish to Fedora 19:

nemo, the file manager, has been heavily modified to integrate its behavior with Cinnamon.

screensaver has been improved, including a lock screen with customizable away message.

control center is more comprehensive.

desklets are desktop applets, and the Cinnamon community offers a variety of them.

spices are Cinnamon customizations, such as desklets, applets, themes, and extensions. They can now be installed with a desktop utility.

While originally based on GNOME, Cinnamon is maturing into an independent, fully featured fork. For news and details about the Cinnamon project, visit <http://cinnamon.linuxmint.com>

3.1.2. GNOME

Fedora 19 includes the latest version of the **GNOME** desktop, 3.8. For more information about what is new in this GNOME release, visit the project's release notes at <http://library.gnome.org/misc/release-notes/3.8>

3.1.2.1. Session logs moved into journal

User session logs, previously stored in `$HOME/.cache/gdm/session.log`, have moved into the journal.

To view your user session log, identify your user ID and view the journal for that **UID** :

```
$ id
uid=1000(username) gid=1000(username) groups=1000(username)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
$ journalctl _UID=1000
```

3.1.2.2. Support for extracting RAR files

File Roller, the graphical archive manager for GNOME, can support extraction of files from RAR archives after installation of the *unar* package. *unar* is a free and open source command line multi-format extractor that is part of The Unarchiver project for extracting RAR files, including encrypted and multi-volume archives. In previous Fedora releases, users have had to install the non-free *unrar* tool from a third party repository for the same purpose. This is not necessary anymore.

Fedora still does not have any default support for creating new RAR files since there is no free and open source tool that provides this functionality. Fedora however includes support for several free and open source compression formats that are generally considered to be more efficient than RAR, such as the popular [XZ format](#) and it is recommended that you use it to distribute compressed files.

3.1.3. KDE

Fedora 19 features KDE Plasma Workspaces version 4.10 and the newest version of KDE Platform and Applications. To learn more about the release, consult <http://www.kde.org/announcements/4.10/>

3.1.3.1. KScreen

Configuration of multiple displays is improved with **KScreen**, a new screen management software for KDE. It has a new UI for monitors configuration and automatic saving and restoring of profiles for connected monitors.

Read more about **KScreen** at <http://community.kde.org/Solid/Projects/ScreenManagement>

3.1.4. MATE

The latest version of a familiar favorite, **MATE 1.6** builds on modern functionality to provide a polished, stable desktop environment.

Read more about changes in **MATE** from the project's release announcement at <http://mate-desktop.org/2013/04/02/mate-1-6-released/>

3.2. Productivity

3.2.1. LibreOffice 4.0

LibreOffice has been updated to version 4.0, with many notable features and fixes. For detailed information on these changes, read <http://www.libreoffice.org/download/4-0-new-features-and-fixes/>

3.2.2. Command line tools

findutils has been updated to version 4.5.11, bringing several functional changes. Users of **find** should consult `/usr/share/doc/findutils-*/NEWS` for changes, including **xargs**, **printf** and **regex** functions.

sed gains the new command **F** to print the input file names, a new option **-z** or **--null-data** to separate lines by ASCII NULL characters, and other fixes described in `/usr/share/doc/sed-*/NEWS`

3.3. Networking

3.3.1. Federated VoIP

Fedora 19 offers better support for truly federated VoIP, with the *reSIProcate* (repro) SIP proxy and *reTurnServer*, an ICE, STUN, and TURN server for both SIP and XMPP (Jabber) networks.

3.3.2. Improved Mobile Broadband support

Fedora 19 includes a new, more capable version of **ModemManager** for interacting with mobile broadband devices. This version provides better support for multi-mode devices like Qualcomm Gobi WWAN cards and other devices that support the **CDMA/EVDO/LTE** standards, the **GSM/UMTS/LTE** standards, or devices that can support either. To provide this support, the **D-Bus** API of **ModemManager** has changed, which may require updates in applications that interact with **ModemManager** to control WWAN devices.

Many devices will connect and authenticate using the **NetworkManager** GUI. **nm-cli** has added features to configure mobile connections. For more detailed usage information, consult <http://fedoraproject.org/wiki/Features/MoreMobileBroadband>.

3.3.3. firewalld improvements

The firewall daemon, **firewalld**, introduced as the default firewall solution in Fedora 18, adds new features to allow easy configuration of this powerful firewall.

3.3.3.1. Locking the firewall and whitelisting changes

Dynamic firewall configuration by applications can now be locked down completely, or limited to a whitelist. The whitelist can contain commands, users, UIDs, and **SELinux** contexts.

To lock down the firewall, set **Lockdown=yes** in **/etc/firewalld/firewalld.conf** and reload the firewall.

```
firewall-cmd --reload
```

The firewall should be reloaded for any changes to the whitelist to take effect.

The whitelist configuration is located in **/etc/firewalld/lockdown-whitelist.xml** and is empty by default. The whitelist below will allow only **firewall-cmd** to make changes to the firewall. The ***** character allows the rule to match arguments passed to **firewall-cmd**

```
<whitelist>
  <command name="/usr/bin/python /bin/firewall-cmd*" />
</whitelist>
```

For more information on **firewalld** lockdown, consult the feature page at <http://fedoraproject.org/wiki/Features/FirewalldLockdown>

3.3.3.2. Rich Language for rule configuration

Fedora 19 includes the latest **firewalld** version, which supports a rich language to be able to create more complex firewalls in a easy way. To take advantage of the new system, read <http://fedoraproject.org/wiki/Features/FirewalldRichLanguage>

3.3.4. OpenVPN 2.3

OpenVPN has been updated to version 2.3, bringing numerous feature enhancements, bugfixes, and expanded documentation. For detailed information on these changes, consult <https://community.openvpn.net/openvpn/wiki/ChangesInOpenvpn23>

3.3.5. OpenConnect

OpenConnect has been updated to version 4.99, adding XML POST support for solutions such as **AnyConnect**, the **--os** switch to report a different OS type to the gateway, and **SecurID** token support using *libstoken*.

3.3.6. BIND10

The **BIND10** suite is now shipped in the Fedora repositories. This includes the DNS server daemon **named**, the **dhcpcd** server daemon, and related utilities. Documentation is available at <http://bind10.isc.org/wiki> and the [BIND10 Guide](#).

Starting with Fedora 19, the **named** PID file has been moved from **/var/run/named/named.pid** to **/run/named/named.pid**. Users with a custom **named.conf** migrating to Fedora 19 should add a **pid-file** statement to the **options** section:

```
options {
    ...
    pid-file      "/run/named/named.pid";
    ...
};
```

3.3.7. Stable network interface naming

The **udev** service has a long history of providing predictable names for block devices and others. Fedora will now also use **udev** naming for network interfaces by default, providing more reliable interface names on systems with multiple network devices. Alternative naming schemes, such as custom udev rules or *biosdevname*, will override this default. Users upgrading from previous releases may need to update the device names referenced in `/etc/systemd/network-scripts/`, although in most cases *biosdevname* will continue to manage naming.

For more information, read <http://www.freedesktop.org/wiki/Software/systemd/PredictableNetworkInterfaceNames>.

3.4. Internationalization

3.4.1. Input Methods

▸ *ibus*

Default keybinding to turn Input Method on and off has been changed to **Super+space**

IME switcher dialog is implemented on **GNOME** Desktop

ibus-setup provides two options for desktops other than GNOME: **use system keyboard** and **Embed preedit test in application window**

▸ *ibus-kkc*, or **Kana Kanji Conversion**, is the new default Japanese input method engine using the new *libkkc* backend. It replaces *ibus-anthy*.

▸ *ibus-libpinyin*, an intelligent pinyin engine using *libpinyin*, now supports configuring enabled directories and importing third party dictionaries from the setup dialog.

▸ *ibus-bogo* is a new Vietnamese engine for **ibus**.

▸ *ibus-typing-booster* now makes better use of *hunspell* when making suggestions, and supports **Tab** completion.

▸ *imsettings* now checks the `org.gnome.settings-daemon.plugins.keyboard.active` gsettings key to determine if **imsettings** should manage input methods on GNOME and Cinnamon desktops. If you do not want to use IBus integration for them, set the key to **false**.

3.4.2. Fonts

fonts-tweak-tool now has support for embedded bitmaps, font substitution configuration, and OpenType Feature Tags.

Lohit fonts have a number of improvements:

Dropped reserved font name from OLF license.

lohit-devanagari-fonts has corrected "ꣳ" syllable with `mr_IN` locale.

lohit-gujarati-fonts has fixed shape of character "Dha" U+0AA7.

lohit-kannada-fonts has fix for vowel signs syllables and NGA and NYA glyphs attachment with vowel signs.

lohit-malayalam-fonts now supports Dot Reph (u0D4E), works well with *harfbuzz-ng*.

lohit-tamil-fonts has modified zero to five numerals, Rupee sign (u0BF9) and correct rendering of Tamil Letter RA,RI,RII as per GoTN standards.

lohit-telugu-fonts now connect NYU ృ + ూ and NYUU ృ + ూ combination properly.

paktype-naskh-basic-fonts, *paktype-naqsh-fonts*, *paktype-tehreer-fonts* and *paktype-ajrak-fonts* have gained the Turkish Lira symbol and bug fixes with **Hamza Below Ye**

A new font family for Hebrew, **shofar**, is available in the *culmus-shofar-fonts* package.

New hinted open type fonts for Latin, Armenian, Devanagari Ethiopic Georgian, Hebrew, Khmer, Lao, Tamil and Thai scripts are available in the package *google-noto-fonts*

3.4.3. Translation tools

Fedora has gained a translation tool, *tw*. It translates words between languages using internal dictionaries, Google Translation, and FreeTranslation.

4. Changes in Fedora for Developers

4.1. Development

4.1.1. Scratch

Fedora 19 includes *Scratch*, the graphical programming environment from the **Lifelong Kindergarten Group** at the **IT Media Lab**. *Scratch* makes it easy to create your own interactive stories, games, animations, music, and art.

Install Scratch with

```
yum install scratch
```

and run either from your desktop's application menu (under Programming) or by typing ``scratch`` in a terminal window.

4.1.2. New Ruby 2.0.0

Ruby is available in Fedora 19. The new release provides additions to the core language, new built-in libraries, improved debug support, and performance enhancements.

The Ruby project has given detailed changes and compatibility guidelines, in the release announcement available at <http://www.ruby-lang.org/en/news/2013/02/24/ruby-2-0-0-p0-is-released/>

4.1.3. JRuby 1.7

JRuby has been updated to version 1.7 and featuring improved packaging. Details on the release are available at <http://jruby.org/2012/10/22/jruby-1-7-0.html>

4.1.4. Erlang

The general purpose concurrent programming language and runtime *Erlang* has been updated to **R16B**. The full changelog is available at http://www.erlang.org/download/otp_src_R16A_RELEASE_CANDIDATE.readme and http://www.erlang.org/download/otp_src_R16B.readme. Documentation includes <http://vimeo.com/44790646> and http://www.erlang.org/download_release/17

4.1.5. Boost Updated to 1.53

Fedora 19 includes Boost version 1.53. Compared to 1.50 shipped with Fedora 18, Boost 1.53 comes with several new libraries:

Context, for context switching

Coroutine, a coroutine library

Lockfree, lockfree data structures

Multiprecision, extended precision arithmetic types for floating point, integer and rational arithmetic

Atomic, C++11-style atomic<>

Odeint, for solving ordinary differential equations

Many other libraries were updated. The detailed release notes are available for Boost 1.51.0, 1.52.0 and 1.53.0:

[Boost 1.50.0 Release Notes](#)

[Boost 1.51.0 Release Notes](#):

[Boost 1.52.0 Release Notes](#):

[Boost 1.53.0 Release Notes](#)

Backwards Compatibility

Note that neither API, nor ABI compatibility with Boost 1.50 may be assumed. Third party applications built against older versions of Boost will need to be recompiled, and may need to be patched to work well with Boost 1.53.

4.1.6. GNU Guile updated to version 2.0.7

GNU *Guile* has been updated to version 2.0.7. Third party applications that depend on legacy guile can use the *compat-guile18* package. More information about Guile 2 can be found at <http://www.gnu.org/software/guile/download.html#releases>

4.1.7. Python

4.1.7.1. Pillow replaces PIL

The Python Imaging Library, or *PIL*, has been replaced with *Pillow*, an actively maintained fork, which also offers Python 3 compatible modules. *Pillow* is a drop-in replacement for *PIL*, except that importing modules now requires

```
from PIL import <Module>
```

syntax instead of simply

```
import <Module>
```

This change does not break backwards compatibility with the legacy PIL. Documentation is available at <https://github.com/python-imaging/Pillow/>

4.1.7.2. PyXML removed, use stdlib

Python programmers who use the *xml* module may find that a few pieces of it work differently than in the past. This is due to Fedora no longer shipping *PyXML*. This change allows the python **stdlib** *xml* module to be visible to programmers. *PyXML* had replaced the **stdlib** code with its own less maintained code, and dropping *PyXML* ensures that the **stdlib** functions are preferred.

4.2. Development Tools

4.2.1. Checkpoint and restore with *crtools*

The **CRIU (Checkpoint/Restore in User-space)** project offers a user-space implementation of process and process group checkpoint/restore. With the user-space tools *crtools* available in this release it is possible to checkpoint processes and restore them at a later time again (e.g. after a crash) or migrate the checkpointed process or process group to another system. CRIU aims to be as transparent as possible so that no instrumentation or re-compilation of the process to be checkpointed is necessary.

To dump a process, use the command:

```
crtools dump -D /path/to/dump-directory -t <PID>
```

To restore a process, use the command:

```
crtools restore -D /path/to/dump-directory -t <PID>
```

The CRIU project can be found at <http://criu.org>

4.2.2. Developer's Assistant

New developers get a quick start with Developer's Assistant, a set of tools for rapidly starting projects with a variety of languages and frameworks. The *devassistant* package currently supports:

C and **C++**

python including **django** and **flask**

java including **jsf** and **maven**

4.2.3. MEMSTOMP

Fedora 19 offers *MEMSTOMP*, a DSO which can be preloaded into an application to discover overlapping memory arguments to certain functions at a lower runtime cost than *valgrind*.

4.2.4. New Tools

recode adds the ability to convert files between character sets and usages

comdemod is a tool to assist with large scale code base refactors.

jimtcl, a lightweight Tcl implementation.

fox, a C++ based toolkit for developing graphical user interfaces easily and effectively.

4.3. GCC Tools

4.3.1. GCC 4.8.x

As of Fedora 19, GCC 4.8.x is shipped as the default GCC. In addition, all Fedora packages have been rebuilt with GCC 4.8.x (and GLIBC 2.17; see below)

Users will be able to examine compiled code improvements and use the newly added features, such as improved C++11 and C11 support, improved vectorization support, etc.

Updates to GCC include the *MinGW* cross-compiler. One of the most notable changes is that the default exception handling model for the **win64** target was changed from **SjLj** to **SEH**. The **win32** target still uses the **SjLj** exception handling model. This causes all binaries for the **win64** target which use exception handling to depend on **libgcc_s_seh-1.dll** instead of **libgcc_s_sjlj-1.dll**.

For more information on the changes in GCC 4.8.x, please visit <http://gcc.gnu.org/gcc-4.8/changes.html>

4.3.2. GLIBC 2.17

As of Fedora 19, GLIBC 2.17 is shipped as the default GLIBC. All Fedora packages have been rebuilt with GLIBC 2.17 (and GCC 4.8.x; see above).

For more information on the changes in GLIBC 2.17, please refer to <http://sourceware.org/ml/libc-announce/2012/msg00001.html>

4.4. D

4.5. Haskell

GHC has been updated to 7.4.2, Haskell Platform to 2012.4, and many other library updates.

4.6. Java

4.6.1. Java 8 technical preview

This release of Fedora includes a technological preview of Java 8, offered through the *java-1.8.0-openjdk* and *java-1.8.0-openjdk-devel* packages.

Java 7 continues to remain the default **JDK** for this release. The inclusion of Java 8 and OpenJDK8 will allow developers to develop and test their applications for the next version of **Java** in parallel while everyone can continue using the stable Java 7 for daily use.

New features of OpenJDK8 are listed at <http://openjdk.java.net/projects/jdk8/features/>

4.6.2. Simplified Maven packaging

Improved and simplified way to create RPM packages out of **Apache Maven** projects have been introduced. Details and conversion recipes from old spec files may be found at <http://mizdebsk.fedorapeople.org/xmvm/cookbook/>

4.6.3. Thermostat 1.0

Fedora 19 includes *Thermostat* 1.0, the first API-stable release of thermostat, a monitoring, instrumentation and serviceability tool for OpenJDK.

For usage information, consult the *Thermostat* user guide at <http://icedtea.classpath.org/wiki/Thermostat/UserGuide>

4.7. Web Development

4.7.1. PHP updated to 5.5.0

The popular programming language *PHP* has been updated to version 5.5.0. This includes a number of significant new features, including support for [Generators](#), the new **Zend Optimizer+** Opcode cache, and a number of performance enhancements.

For complete details refer to Migrating from PHP 5.4.x to PHP 5.5.x PHP developers should read `/usr/share/doc/php-common-*/NEWS` to learn about the changes and consult the migration guide at <http://www.php.net/manual/en/migration55.php>.

4.7.2. Node.js

Fedora 19 now includes the **Node.js** JavaScript runtime environment for developing fast, scalable network applications using the JavaScript programming language. Also included is the *npm* package manager that provides access to over 20,000 libraries and applications available under free and open source licenses.

For more information about *Node.js*, visit <http://nodejs.org> or review the documentation in the *nodejs-docs* package.

For more information about *npm*, including a directory of available libraries and programs, visit <http://npmjs.org/>.

4.7.3. Django 1.5

Fedora 19 features version 1.5 of the popular Django web application framework. This version features improvements that make it easier to provide custom authentication functionality, improved caching support, a new template tag makes it easier to use JavaScript templates inside Django templates, and more.

For complete details, review the Django 1.5 release notes at <https://docs.djangoproject.com/en/dev/releases/1.5/>.

5. Changes in Fedora for Specific Audiences

5.1. Scientific and Technical

5.1.1. E

The *E* theorem prover version 1.7 is now included in Fedora 19. Improvements include:

- » Improved automatic mode
- » Interactive querying against large specifications
- » Various minor bugfixes

5.1.2. gabedit

gabedit has been upgraded to 2.4.6. Improvements include:

- » Gabedit can now read orbitals from GENNBO files
- » Several filters (Gaussian, Blackman, Blackman-Harris,...) implemented in the GabeditXYPlot window
- » Psi4 is partially supported : input file, geometries, frequencies, UV Spectrum
- » NCI (non-covalent interactions index) analysis implemented (see Johnson et al., J. Am. Chem. Soc. 132, 6498 (2010))
- » Analysis of Spatial Extent in Charge-Transfer Excitations implemented (See Le Bahers et al., J. Chem. Theory Comput. 2011, 7, 2498-2506)

5.1.3. gdl

The Gnu Data Language, *gdl*, has been updated to 0.9.3. New features include:

- » support for empty arrays and **!NULL** system variable
- » promotion of **FOR** loop index variable type
- » **SCOPE_VARFETCH** (only **LEVEL** keyword supported)
- » support for **.SKIP [NSteps]** command
- » keyword **DIM** in **MOMENT()**, **MEAN()**, **STDDEV()**, **VARIANCE()**, **SKEWNESS()**, **KURTOSIS()**
- » keyword **SIGN** in **FINITE**
- » various improvements on **READ_JPEG**, **READ_PNG**, **WRITE_JPEG**, **WRITE_PNG**
- » keyword **ICONIC** in **WSHOW**
- » keyword **ISOTROPIC** in **PLOT**, **CONTOUR**
- » new widget features incl. **WIDGET_LIST** and **CW_GROUP**
- » support for some overloaded operators (**_overloadIsTrue**, **_overloadPlus**, **_overloadMinus**, **_overloadBracketsLeftSide**, **_overloadBracketsRightSide**, **_overloadEQ**, **_overloadNE**)

There are also some newly implemented routines:

- STRMATCH(), USERSYM
- LUDC, LUSOL and DETERM
- ROT, CONGRID and BILINEAR
- TV for PS output
- QROMB(), QSIMP() and QROMO()
- TRISOL()
- STANDARDIZE and HIST_EQUAL
- FX_ROOT
- FZ_ROOTS

5.1.4. genius

genius has been updated from version 1.0.14 to 1.0.16. Changes include:

- New functions CurrentTime, MacaulayRep, MacaulayLowerOperator, MacaulayBound
- Fix rational powers of negative numbers, and exact negative rational powers
- Fix zooming in graphs using the mouse when the functions take long to run
- Accept log instead of ln for symbolic derivative when used with only one parameter
- Add SurfacePlotData and SurfacePlotDataGrid functions to draw arbitrary surface data, to allow more complicated 3d plots and 3d plots from data
- Add LinePlotDrawAxisLabels and SurfacePlotDrawLegends parameters and add corresponding UI checkboxes
- Add ExportPlot function to export the current contents of the plot window to a file from GEL
- Surface plot now allows "fit dependent axis" automatically when z limits are unspecified. And this is the default in the UI
- Add sinc, BesselJ0, BesselJ1, BesselJn, BesselY0, BesselY1, BesselYn function
- Plot window slightly bigger (700x500 now) and there are wider side margins in the lineplot (2D) version to make tick labels always fit
- In both 2D and 3D plots, tick labels now use scientific notation when needed to avoid ugly labels
- In surface plot the gradient always shows only the range of the function, so color is more useful when zoomed out
- Simpler output when typing "help foo" when foo is neither defined nor documented
- When for/sum/prod loops are in terms of floating point numbers and the final number is within 2⁻²⁰ times the step size of the goal, assume there were roundoff errors and still execute the body
- Handle wider matrices than 2¹⁵ columns in expansion
- Fix flicker when plotting surfaces to allow animations with 3d plots
- Fix possible uninitialized crash when reading badly formed standard library
- Fix LinearRecursiveSequence and allow it to take vector for n
- Fix crash on uninitialized variables in conjugate transpose
- Fix crash on extreme zoom out or zoom in of a graph
- Fix derivatives of Im and Re
- Fix file chooser dialogs not starting in current directory
- Avoid double error about uninitialized variables
- Spelling fixes and documentation fixes
- Require MPFR at least 2.3.0

5.1.5. gnome-chemistry-utils

Fedora 19 includes the latest 0.14.2 version of *gnome-chemistry-utils*. Compared to 0.13.99 there are some changes to **GChemPaint**:

- Fix reaction construction
- Fix non bonding electron pairs
- Do not allow a mesomery destruction when inside a reaction

5.1.6. gromacs

gromacs 4.6.1 is included in Fedora 19. In addition to the *gromacs* package itself, the following related packages have also been changed:

```
gromacs-bash
gromacs-common
gromacs-csh
gromacs-devel
gromacs-libs
gromacs-tutor (dropped)
gromacs-zsh
```

In addition to various bug fixes, 4.6.1 includes the following changes:

- increased shared object major version to 8
- updates to HTML manual, install guide, PDF manual, shell completions
- new and enhanced error messages
- various GPU performance enhancements
- more checks for system support for setting thread affinities

- › removed inter-flag dependency in `g_order`
- › incorporated new changes from release 4.5.x branch
- › adding warning about not building with `icc` version < 12

5.1.7. HippoDraw

HippoDraw has been dropped from Fedora.

5.1.8. kst

kst has been upgraded to 2.0.6. New features include:

- › user-visible string changes
- › finish UI revamp (esp. context menus + connect plot dialog pages to the way the dialog is opened, e.g. double click on axes opens plot dialog in the right place)
- › scientific notation for extreme axis numbers
- › change scalar value directly in the scalar selection combobox
- › as-you-type search in comboboxes (vector selection)
- › view items have an option to scroll/zoom with the contents of the plot
- › improve automatic plot layout algorithm
- › option to have anti-aliased plots
- › mouse wheel scrolls and zooms
- › Adding a drag and drop capability
- › data source text box handles `~/` as shortcut to `$HOME`
- › legends wrapped to always fit inside their plot
- › new datasource: Matlab `.mat` file reader (Matlab pretty much sucks at plotting, that'd be a pretty interesting move and there's a spec at http://www.mathworks.com/access/helpdesk/help/pdf_doc/matlab/matfile_format.pdf)
- › beta of python-based, matplotlib-alike scripting (Linux only for now)

5.1.9. Octave

octave has been updated to 3.6.4.

5.1.10. qcad

qcad has been dropped from Fedora.

5.1.11. R

R is a language and environment for statistical computing and graphics. Fedora 19 includes the latest 3.0.0 release of *R*, which is a major upgrade.

Must re-install packages

There are many add-on packages for *R* which must be re-installed for this release.

A major thrust of release 3.0.0 is to better exploit 64-bit platforms, however there are many, many improvements to a number of functions. Perhaps obviously, support for long vectors has been greatly improved, but there are dozens of improvements to other functions as well.

For full details on this new release of *R*, the reader is referred to the NEWS page at <http://cran.r-project.org/src/base/NEWS.html>.

In addition to updates to *R* itself, a number of *R* packages have also been enhanced. The table below lists those packages and the upstream web sites to obtain additional information:

Table 1. Updated R Packages

Package	Old Version	New Version	Upstream URL
<i>R-affyio</i>	1.22.0	1.28.0	http://bioconductor.org/packages/release/bioc/html/affyio.html
<i>R-Biobase</i>	2.14.0	2.20.0	http://bioconductor.org/packages/release/bioc/html/Biobase.html
<i>R-BSgenome.Celegans.UCSC.ce2</i>	1.3.17	1.3.19	http://www.bioconductor.org/packages/release/data/annotation/html/BSgenome.Celegans.UCSC.ce2.html
<i>R-BufferedMatrix</i>	1.20.0	1.24.0	http://bioconductor.org/packages/release/bioc/html/BufferedMatrix.html
<i>R-car</i>	2.0	2.0.16	http://cran.r-project.org/web/packages/car/index.html
<i>R-hgu95av2probe</i>	2.9.0	2.12.0	http://www.bioconductor.org/packages/release/data/annotation/html/hgu95av2probe.html
<i>R-IRanges</i>	1.14.4	1.18.0	http://bioconductor.org/packages/release/bioc/html/IRanges.html
<i>R-java</i>	2.15.2	3.0.0	http://www.r-project.org
<i>R-java-devel</i>	2.15.2	3.0.0	http://www.r-project.org
<i>R-lmtest</i>	0.9.29	0.9.30	http://cran.r-project.org/web/packages/lmtest/index.html
<i>R-multcomp</i>	1.2	1.2.17	http://cran.r-project.org/web/packages/multcomp/index.html
<i>R-mvtnorm</i>	0.9.9991	0.9.9994	http://cran.r-project.org/web/packages/mvtnorm/index.html
<i>R-qtl</i>	1.25.15	1.27.10	http://www.rqtl.org/
<i>R-qvalue</i>	1.30.0	1.34.0	http://bioconductor.org/packages/release/bioc/html/qvalue.html
<i>R-rlecuyer</i>	0.3.1	0.3.3	http://cran.r-project.org/web/packages/rlecuyer/index.html

5.1.12. Veusz

veusz has been updated to 1.17.1. Some new features include:

- » Allow coloured points for non-orthogonal plots (polar, ternary)
- » Remove unnecessary exception data
- » Add new broken axis widget with gaps in the numerical sequence
- » Grid lines are plotted always under (or over) the data
- » Shift+Scroll wheel scrolls left/right
- » Polar plots can have a "minimum" radius and log axes
- » Many more LaTeX symbols added
- » Add SAMP/NoTable support
- » New shifted-points xy line mode, which plots a stepped line with the points shifted to lie between the coordinates given
- » Points can be picked to console and/or clipboard
- » Allow reversed ternary plot

5.1.13. Sailcut

Fedora 19 adds *sailcut*, CAD software for designing and visualizing sails.

5.2. Circuit Design

5.2.1. gtkwave

gtkwave has been updated from 3.3.41 to 3.3.46.

5.2.2. Xcircuit

xcircuit has been updated to 3.7.44. Version 3.7 has a modified selection mechanism that considers both points and segments of elements as well as entire elements. This allows the "edit" function to work as a stretch function to many elements at once.

Also added linewidth invariance on objects. Object instances (such as circuit symbols) can be made linewidth-invariant, such that an instance of the object can be scaled without changing the linewidth. This allows some circuit symbols to be resized relative to others on the same schematic without a discontinuity in wire width at the pins.

A number of other useful additions including:

- » Tracking spline control points for adjoining splines in paths
- » Clipmasks (shapes can be used to clip the view of other elements)
- » polygon-to-curve conversion routine
- » undo/redo on raise/lower elements
- » single-step raise and lower elements
- » gradient field generator---color graded fields are made from graphic image types

5.3. Embedded Development

5.3.1. avr-gcc

avr-gcc and *avr-gcc-c++* have been updated to 4.7.3. Changes include:

- » The **-fconserve-space** flag has been deprecated. The flag had no effect for most targets: only targets without a global `.bss` section and without support for switchable sections. Furthermore, the flag only had an effect for G++, where it could result in wrong semantics (please refer to the GCC manual for further details). The flag will be removed in GCC 4.8
- » The AVR port's `libgcc` has been improved and its multilib structure has been enhanced. As a result, all objects contributing to an application must either be compiled with GCC versions up to 4.6.x or with GCC versions 4.7.1 or later. If the compiler is used with AVR Libc, you need a version that supports the new layout, i.e. implements #35407.
- » The AVR port's **-mshort-calls** command-line option has been deprecated. It will be removed in the GCC 4.8 release. See **-mrelax** for a replacement.
- » The AVR port only references startup code that clears `.bss` and the common section resp. initializes the `.data` and `.rodata` section provided respective sections (or subsections thereof) are not empty, see PR18145. Applications that put all static storage objects into non-standard sections or define all static storage objects in assembler modules, must reference `__do_clear_bss` resp. `__do_copy_data` by hand or undefine the symbol(s) by means of **-w1, -u, __do_clear_bss resp. -w1, -u, __do_copy_data**.
- » GCC versions 4.7.0 and 4.7.1 had changes to the C++ standard library which affected the ABI in C++11 mode: a data member was added to `std::list` changing its size and altering the definitions of some member functions, and `std::pair`'s move constructor was non-trivial which altered the calling convention for functions with `std::pair` arguments or return types. The ABI incompatibilities have been fixed for GCC version 4.7.2 but as a result C++11 code compiled with GCC 4.7.0 or 4.7.1 may be incompatible with C++11 code compiled with different GCC versions and with C++98/C++03 code compiled with any version.

In addition, there are a number of improvements to the optimizer. The reader is referred to <http://gcc.gnu.org/gcc->

[4.7/changes.html](#) for additional details.

5.3.2. `gputils`

`gputils` has been upgraded to version 1.1.0 from 0.14.3. Changes in 1.1.0 include:

- ▶ added `-P` (`--preprocess`) command line option to emit preprocessed asm file
- ▶ added support for undocumented `HALT`, `TRAP` and `TRET` opcodes
- ▶ `.inc` and `.lkr` files are synced with `MPLABX 1.70`
- ▶ fixed support for 12 bit extended instruction set, devices PIC12F529T48A, PIC12F529T39A, PIC16F527 and PIC16F570

5.3.3. `z88dk`

`z88dk` has been upgraded from 1.10 to 1.10.1. This slightly modified release includes a bugfix in CPP preventing the inline assembler to work correctly plus few minor target specific corrections (ZX81 and MTX among the others)

5.4. Amateur Radio

5.4.1. `chirp`

`chirp` has been upgraded to 0.3.0. Some new features:

- ▶ Automatic split->offset conversion during import when odd-split is not supported
- ▶ Per-memory extra settings and detailed editing
- ▶ TravelPlus importing
- ▶ RadioReference importing

In addition, the following new radios are supported:

- ▶ Baofeng UV-5R
- ▶ Icom IC-208H
- ▶ Icom IC-T7H
- ▶ Icom IC-T8A
- ▶ Icom IC-746
- ▶ Kenwood TM-G707
- ▶ TYT TH-UV3R
- ▶ TYT TH-UVF1
- ▶ Yaesu FT-1802M
- ▶ Wouxun KG-UV6D/UV6X

5.4.2. `demorse`

`demorse` has been updated to 1.1. This is primarily a maintenance release and no changes should be user visible.

5.4.3. `fldigi`

`fldigi 3.21.68` is now included in Fedora 19. This is primarily a maintenance/bugfix release.

5.4.4. `gnuradio`

There are quite a number of changes to get `gnuradio` to version 3.6.4.1, including:

- ▶ Addition of the ability to add and connect formally defined asynchronous message ports to signal processing blocks and hierarchical blocks
- ▶ the concept of PDUs (Protocol Data Units) as a convention for passing data+metadata using the new messaging ports
- ▶ A few new general purpose blocks supporting these capabilities are in `gnuradio-core`:
 - `gr_message_debug`
 - `gr_message_strobe`
 - `gr_tagged_stream_to_pdu`
 - `gr_pdu_to_tagged_stream`
- ▶ Two new blocks for interfacing with networking stacks using the new PDU semantics:
 - `gr_socket_pdu`
 - `gr_tuntap_pdu`
- ▶ Addition of new Python-based signal processing blocks
- ▶ Addition of `gr-analog` top-level component
- ▶ Addition of `gr-blocks` top-level component
- ▶ Metadata file source and sink blocks
- ▶ GNU Radio buffer latency control
- ▶ Ability to set processor affinity for GNU Radio blocks
- ▶ Inclusion of `gr_modtool`
- ▶ Use of GNU Radio preferences in native C++ applications

- Addition of GNU Radio block performance counters
- dozens of other features considered minor

5.4.5. linsmith

Fedora 19 includes version 0.99.24 of *linsmith*. Improvements include:

- Slight improvements to the vector plot.
- Better default values for colors of plot.
- Modified the `confmgr` to accept hex and octal values in the configuration file.
- Removed the (deprecated) `gnomeprint` dependency. Now the complete print route relies on Pango/Cairo to generate the plot, and the `GtkPrint` interface to do the actual printing.
- Change `papersize_combo` to `combobox`, and load the list from the available papersizes.
- Adapted `confmgr` to accept `char *` from `comboboxes`.
- Moving elements up implemented.
- Converted the strange negative default values for the color definitions to their (easier to understand?) hex values.
- The 'standard cable' code mostly re-written, and a few more cable types added.

5.4.6. soundmodem

soundmodem has been updated to 0.16, primarily to interoperate with *systemd*.

5.4.7. xnec2c

xnec2c 2.1 includes a number of improvements:

- Modify the *xnec2c* user interface so that it will, as far as possible, allow the user to save and re-open NEC2 files in the Editor window, without closing the Radiation Pattern and/or the Frequency Plots windows
- replaced all the (deprecated) GDK drawing primitives with equivalent Cairo graphics equivalents (e.g. replaced `gdk_draw_line()` with `cairo_line_to()`) since Cairo provides for nicer anti-aliased drawing.
- added code to save data of the structure display, radiation patterns and frequency plots into file, in a format suitable for the "gnuplot" plotting program

A. Contributors

A large number of people contribute to Fedora each release. Among these are a number of writers and translators who have prepared these release notes. The following pages list those contributors.

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B. Revision History

Revision 19-11	Thu Jun 13 2013	
Post-beta updates and fixes		
Revision 19-09	Fri May 24 2013	
Updated revision for F19 Beta		
Revision 19-08	Mon May 13 2013	
Initial Draft for F19 Beta		
Revision 18-0	Tue Jan 8 2013	
Revision for F18 final		
Revision 17-98	Wed Nov 7 2012	
Prepare for Fedora 18 Beta		
Revision 17-95	Sun Oct 28 2012	
Initial revision for F18 Pull in and proofread content from wiki		
Revision 17-1	Tue May 29 2012	Refer to A.1 Writers
64 bit default BZ#821168 Release Notes directory change BZ#821412 Typo in Sci/Tech (EMWA) BZ#821413 D language BZ#824529 Update contributors Remove Cloudstack reference		
Revision 17-0	Tue May 8 2012	Refer to A.1 Writers
Remove draft tag Add translation contributors		
Revision 16-97	Mon May 7 2012	Refer to A.1 Writers
BZ#817295 - various typos and broken links BZ#817553 - Typos and broken formatting in Amateur Radio and Scientific and Technical sections gimp has been updated to 2.8.0 Section on multi-seat Changes to direct kernel boot BZ#819160 - Typo in Circuit Design BZ#819161 - Correct URL in Circuit Design BZ#819164 - typo in Embedded Development section Bump kernel version to 3.3.4		
Revision 16-96	Tue Mar 27 2012	Refer to A.1 Writers
Added list of writers Added Desktop section Added index entries		

Added note on btrfs

Revision 16-95 Released Beta F17 notes	Wed Mar 21 2012	Refer to A.1 Writers
Revision 16-93 Start beta F17 notes	Tue Mar 20 2012	John McDonough
Revision 16-3 Minimum RAM correction - BZ#754439 Service name changes - BZ#754145 Change verbiage around CPU requirements - BZ#499585	Tue Nov 29 2011	John McDonough
Revision 16-2 Trusted boot didn't make it to F16 (Overview, Boot) Added Ask Fedora - BZ#748653 Added list of contributors	Mon Nov 7 2011	John McDonough
Revision 16-1 Various typos - BZ#741975 Better prose on systemd database handling - BZ#743614 Improved prose in setting up multiple PostgreSQL servers - BZ#743618 Warning about GRUB user - BZ#737187 Include mention of D2 - BZ#743960 Warning about UID/GID change - BZ#739661 Clean up links rc.local no longer packaged - BZ#745235 Virtualization security - BZ#746015 GTK capitalization - BZ#747940 QEMU capitalization - BZ#746672 against VG Dedication to Dennis Ritchie	Mon Oct 23 2011	John McDonough
Revision 16-0 Release	Mon Oct 10 2011	John McDonough
Revision 15-99 Mentions of F16 - BZ#741830 Typo in Grub - BZ#743981 Additional index terms	Mon Oct 10 2011	John McDonough
Revision 15-98 Release for F16 Beta	Fri Aug 16 2011	John McDonough
Revision 15-2 Required memory for installation (BZ#699770)	Thu Jun 23 2011	John McDonough
Revision 15-1 Typo in Virtualization (BZ#705928) gnuplot not GNU plot (BZ#707318) device naming (BZ#707730) Correct version number of boost (BZ#707786) Remove reference to disappeared GS-Theme-Selector (BZ#708085)	Fri Jun 3 2011	John McDonough
Revision 15-0 Memory (BZ#699770, 701780) Xfce case (BZ#699977) Wireshark permission changes (BZ#680165) Powering off with systemd (BZ#701638)	Sun May 8 2011	John McDonough
Revision 14-98 Remove Dom0 Remove dnsssec Remove riak Add warning about Network Connections Add prose on IcedTea	Fri Apr 15 2011	John McDonough
Revision 14-97 Add index entries	Mon Apr 11 2011	John McDonough
Revision 14-96 Point Kernel to kernelnewbies (Kernel) Point features to F15 instead of general feature page (Overview) Correct boxgrinder URL (Virtualization) Correct Python URL (Developer Tools) Correct Rails URL (Developer Tools) Correct avr-gcc URL (Embedded Development) Correct avr-c++ URL (Embedded Development)	Tue Apr 5 2011	John McDonough

Correct avr-binutils URL (Embedded Development)
Correct dfu-programmer URL (Embedded Development)
Correct xlog URL (Amateur radio)
Correct splat URL (Amateur radio)
Remove redundant systemd and add administrative user per Rahul

Revision 14-95 **Tue Apr 5 2011** **John McDonough**
Converted beats

Revision 14-90 **Tue Mar 22 2011** **John McDonough**
Empty Fedora 15 skeleton

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