

October 22, 2018

Welcome

Summary

- Cytoscape v3.7.0 is now available for immediate download.
- Addresses 133 issues relative to v3.6.1 (see Section 10)
- Significant upgrades to core functionality
 - Annotations Interface
 - Updated support for NDEx network saving and loading
 - Brewer Color palettes
 - Animated tooltips
 - Node, edge, annotation selection toggles
- Numerous app updates and releases since 3.6.1 release
- What to do next ...

Release notes: <http://www.cytoscape.org/releasenotes.html>

Dear Cytoscape User

We are proud and pleased to release Cytoscape v3.7.0. This new release contains both new features and improvements to functionality and documentation as described in Sections 7 and 10.

As of the v3.5 release, we officially withdrew support for Cytoscape 2.x versions, though installable code and documentation will remain available on the Cytoscape web site.

v3.7.0 was not tested on 32 bit JVMs or Windows XP, as they account for a small portion of Cytoscape installations. Certain features of Cytoscape may not function with 32 bit JVMs.

For Windows and Mac systems, v3.6.1+ installs its own JVM (v8) and can operate on systems having Java 9 and later. Linux systems must have JVM 8 (rev 151 or higher) on the path or referenced by the JAVA_HOME environment variable.

This release marks successful tests with the system configurations most common among our user base, including 16 different combinations of operating systems and Java Virtual Machines across Windows, Linux, and Mac OS platforms. Check out your system's configuration here: <https://tinyurl.com/y7ehh6fb>.

To browse the Apps that were updated during the 3.7.0 development cycle, visit the app store (<http://apps.cytoscape.org>). There are 209 apps available for download.

We expect a v3.8 release in Q2 2019. As our plans firm up, we'll publish them to the Cytoscape community (<http://www.cytoscape.org/roadmap.html>). For more on our roadmap, see Section 9.

*If you are a new or casual Cytoscape user, **welcome aboard!** Feel free to either read on or jump ahead to *What to Do Next* for a quick start.*

For Cytoscape v2.x Users

As of the Cytoscape v3.5 release on March 27, 2017, the Cytoscape releases at the 2.x level are no longer supported. This reflects both the great success Cytoscape v3 has had since its initial release on February 4, 2013 and the rapidly diminishing user base for Cytoscape 2.x.

While all version 3 releases are upwardly compatible with previous Cytoscape versions (i.e., they can load, analyze, and display networks and attributes stored using previous versions, including v2.x), they can coexist with previous versions on the same workstation. It is not necessary to uninstall previous versions before installing a newer release, and you can choose to use both on the same workstation.

Version 3 has matured and achieved a reputation for speed, reliability, and support that makes it a *superior choice* (compared to v2.x) for most uses. If you are using v2.x, please switch to v3.6 and enjoy the new v3 features and the Apps available in the App Store (<http://apps.cytoscape.org>).

A table describing Cytoscape support is presented in Section 8.

We are very excited to make this release, and hope you find it an indispensable tool in your research. To get you started, we have provided additional introductory material to set you on the right foot, and we have also provided background material for general interest.

Please let us know how we're doing and how we can better advance your research!

The Cytoscape Team

What to Do Next

We hope to help you use Cytoscape in the most productive way. Your next steps depend on how experienced you are with Cytoscape and what you would like to do. In the table below, please find the category that best describes you, and proceed accordingly.

Type of Cytoscape User	Where to Read Next
New	For New Users (Section 1)
Casual	For Casual Users (Section 2)
Power	For Power Users (Section 3)
App Developers	For App Developers (Section 4)
General Interest	Try getting oriented by reading: General Background (Section 5) Cytoscape App Store (Section 6) Then try browsing: New Features (Section 7) Support Offering (Section 8) Future Plans (Section 9) To get your feet wet, try: For New Users (Section 1)

1. For New Cytoscape Users

What is Cytoscape?

Cytoscape is software that can help you visualize complex networks (as *graphs*) representing relationships between genes, proteins, or other entities. Cytoscape tracks and displays these entities (as graph *nodes*) and relationships between them (as graph *edges*). Cytoscape, per se, does not assign meaning to either nodes or edges – you can assign your own meanings to them, and you can add your own node or edge attributes (e.g., name, measurements, states, etc.) that customize your graph to represent semantics important to you. While Cytoscape provides simple analytics and visualizations, others are available as apps from the Cytoscape App store (see Section 6).

What Do I Need Before I Can Use Cytoscape?

At the very least, you must provide Cytoscape with a list of nodes. You can also provide a list of edges and attributes. You can enter your graph manually or import it from your own files – Cytoscape supports a wide variety of file formats, including text and Excel. Cytoscape can also load pre-configured networks (e.g., from BioGRID) so you can leverage them without having to enter them yourself.

Can Cytoscape Help Me Get Started?

Yes! The Cytoscape team has provided many resources tailored for all kinds of users (see Section 8). To start, there is an Installation Guide and numerous tutorials. Once you load your graph, you may find additional useful analytics and visualizations at the App Store (see Section 6).

Which Cytoscape Version Should I Use?

Generally, you should use v3.6.1 (the newest version). v2.x has been in the field for several years and is now out of support. Cytoscape v3.6.1 has many improvements over previous Cytoscape v3.x releases.

Note that if you have already installed a previous Cytoscape version, you can install v3.6.1 without uninstalling your previous version.

How to Download and Install Cytoscape

- Surf to <http://www.cytoscape.org>, click on the Download Cytoscape button, and follow the prompts
- ***Be sure to consult with the Release Notes (viewable via the Release Notes button) for issues and solutions pertaining to your installation***
- Surf to <http://manual.cytoscape.org> and follow the instructions in the *Launching Cytoscape* section.

How to Troubleshoot Cytoscape Installation?

Normally, the main requirement for installing Cytoscape is a Java Virtual Machine (JVM) appropriate for your workstation. For Windows and Mac users, Cytoscape 3.6.1 provides a suitable JVM if your system doesn't already have one (v8, rev 151 or later). For Linux users, be sure to have a JVM (v8, rev 151 or later) available on your PATH or named via the JAVA_HOME environment variable.

Regardless of your workstation operating system, you can learn whether your environment is sufficient to execute Cytoscape by following the Troubleshooting instructions at

<http://www.cytoscape.org/troubleshooting.html>.

2. For Casual Cytoscape Users

If you're confident of your Cytoscape skills, please read the Power Users information (Section 3).

If you're Cytoscape skills are rusty, please continue with the New Users information (Section 1).

3. For Cytoscape Power Users

Is v3.x for Me?

The answer is most likely yes! Cytoscape 2.x is out of support.

Most modern v2.x plugins have been converted to v3.x apps, and new v3.x apps are more plentiful than v2.x plugins (-- *app* is the v3.x name for the installable features known as a *plugin* in v2.x). To take stock, you can browse the App Store directly (Section 6).

Note that v2.x plugins are not compatible with v3.x apps. If you rely on v2.x plugins that are not yet available for v3.x, you may need to remain with v2.x instead of upgrading to v3.x, though v2.x is no longer supported.

Can I use v2.x and v3.x at the Same Time?

You can experiment with v3.x by installing it on your workstation – you can use both v2.x and v3.x on the same workstation.

How to Prepare for Cytoscape

1. If you have already installed a v3.6.1 RC version, *please uninstall it before proceeding*. Previous Cytoscape versions can coexist with v3.6.1, and do not need to be uninstalled.
2. Consult the App Store (Section 6) to verify that the apps you need are available. Some apps have become part of the Cytoscape core, and you won't need to download them. Other apps are available in the Cytoscape App store.
3. Browse the Future Plans table (Section 9) and Support Offering table (Section 8) to see where the Cytoscape community is going.

How to Download and Install Cytoscape

- Surf to <http://www.cytoscape.org>, click on the Download Cytoscape button, and follow the prompts
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Regardless of your workstation operating system, you can learn whether your environment is sufficient to execute Cytoscape by following the Troubleshooting instructions at <http://www.cytoscape.org/troubleshooting.html>.

4. For Cytoscape App Developers

Cytoscape manages graph storage and display, and contains a number of common analytic and visualization functions. App Developers may write *apps* (formerly known as *plugins*) to perform problem-specific analytics, graph layouts, or other visualizations.

Before starting app development, you should be familiar with overall Cytoscape usage and functionality – see the Power Users section (Section 3) to start working with Cytoscape if you have not already done so.

Should I Convert My v2.x Plugin to a v3.x App?

Yes! Cytoscape v2.x is now out of support.

How Do I Get Started With App Development?

To get started with app development:

<https://github.com/cytoscape/cytoscape/wiki/Cytoscape-App-Ladder>

For a broader view of the Cytoscape system (including the Core), refer to:

http://wikiold.cytoscape.org/Cytoscape_3/CoreDevelopment

Are there App Samples?

Yes! See:

http://opentutorials.cgl.ucsf.edu/index.php/Tutorial:Creating_a_Simple_Cytoscape_3_App

Also note the App Cookbook:

http://wikiold.cytoscape.org/Cytoscape_3/AppDeveloper/Cytoscape_3_App_Cookbook

5. General Background

The overall mission of Cytoscape is to be a freely available worldwide asset supporting network analysis and visualization for systems biology science.

The major focus of v3.x is the modularization and rationalization of code to solve stability issues in v2.x encountered as multiple developers pursued multiple agendas. Under v2.x, internal programmatic interfaces evolved from one release to the next, leading to the failure of working plugins over time and negative interactions between otherwise working plugins. Ultimately, this resulted in loss of programmer and user productivity, and undermined community confidence in Cytoscape.

v3.x addresses these issues by adopting modular coding practices promoted by the OSGi architectural framework¹. This enables both the Cytoscape core and externally developed apps (formerly called *plugins*) to evolve independently without compromising unrelated functionality. At the logical level, Cytoscape leverages OSGi precepts to produce v3.x APIs having cleaner and clearer demarcations between functional areas. At the deployment level, OSGi enables on-the-fly substitution of one processing element for another (e.g., apps) in order to tailor Cytoscape to meet user requirements at runtime without reinstalling or reconfiguring Cytoscape.

Creating v3.x occupied an international team of engineers for over a year, and represents a strong investment toward reducing future development and support costs, and increasing reliability and evolvability. With the completion of v3.x, we expected to leverage v3.x as a platform to satisfy the evolving needs of multiple stakeholder groups, and as a platform enabling research on leading edge analysis and visualization techniques. v3.x is the successor to v2.x, with 2.x now out of support.

During the creation of v3.x, a number of features were added, as listed in the New Feature Table below.

¹ www.osgi.org – also used as the basic framework for Eclipse and numerous commercial products

6. The Cytoscape App Store

The Cytoscape App Store targets broad demographics through specific features:

Cytoscape User	Benefit
New or Casual	Find Cytoscape functionality easy via familiar paradigms of search and tag navigation
Power or Frequent	Find and install apps easy and provide crowdsourced rating and reviews
App Developers	Have a dedicated presence for their work, including a direct line to their users and critical statistics to justify their development on the Cytoscape platform.

Furthermore, the App Store supports contests and social incentives that encourage critical technical and community development, including porting, analytics, rating/reviewing, and so on.

Note that the App Store supports only Cytoscape v3.x and no longer accepts plugins compatible with earlier Cytoscape versions. Likewise, plugins that work with earlier versions are not compatible with v3.x – the App Store (<http://apps.cytoscape.org>) contains a list of apps available for v3.x.

To access the App Store from Cytoscape, access Cytoscape's new Apps menu and choose the App Manager menu item.

7. New Feature Table

Feature	Beneficiary	Manual Section
Annotations Panel	Power users	13 Network Annotations
Brewer Color Palettes	Power users	12.5 Style Tutorials
Network Search Bar Updates	All users	5.3 Import Networks from Public Databases
Toolbar Selection Toggle	All users	11.2 Other Mouse Behaviors
Cytoscape Automation updates	Power Users	25 Cytoscape Automation
NDEx Integration	All users	22 Export Your Data

8. Support Offering Table

Feature	Purpose	Beneficiary	URL
Cytoscape Google Groups <ul style="list-style-type: none">HelpdeskDiscuss	Community response on best effort basis	All users	mailto:cytoscape-helpdesk@googlegroups.com mailto:cytoscape-app-dev@googlegroups.com
User Manual	Comprehensive manual	All users	http://manual.cytoscape.org
Installation Guide	Cytoscape installation	New/Casual users	Section 2 of http://manual.cytoscape.org
Tutorials	Streamlined productivity	All users	http://tutorials.cytoscape.org http://opentutorials.cgl.ucsf.edu/index.php/Portal:Cytoscape3
Presentation Slides on Web Site	Enable casual learning	All users	https://speakerdeck.com/cytoscape
Code Snippets	Commonly used App development code	App Developers	http://wikiold.cytoscape.org/Cytoscape_3/AppDeveloper/Cytoscape_3_App_Cookbook

9. Future Plans Table

Feature	Purpose	Beneficiary	Timeframe
Distributed computing	Link to NDEx and other external storage and compute services	All users	Ongoing
Additional Visualizations			Ongoing
Additional Analytics			Ongoing
Wallpaper Collection	Publicize good results associated with Cytoscape	All users, potential users, general public	TBD
Cytoscape Clinics New/Casual User Power User App Developer	Chat rooms give instant response based on community availability	All users	Ongoing

10. Issues Addressed

The following issues were addressed in v3.7.0. Details for each issue can be found at Cytoscape's RedMine issue repository:

<http://code.cytoscape.org/redmine>

NOTE: The Cytoscape Development team is switching to JIRA as it's issue tracking software.

Issue	Description
4348	Random color generator throws traceback generating more than 8 colors
4345	Deleting Custom Shapes via Annotation Panel Trashcan
4343	Default selection color for Toggle buttons is too light on macOS Mojave
2554	XGMML attribute don't import properly
4287	Annotation issues
4339	Annotation resizes itself
3948	Filehandle kept after import
4325	After adding an annotation resizing it backward doesn't work
4333	Newly created annotations change size when the network is resized
4314	Annotations API should enforce a tree structure
4326	Annotation group saving is inconsistent
4315	Some group Annotations don't maintain relative positioning
4316	Annotation dialog doesn't open up on the monitor where the user's focus is
4238	Extra menu separators
3679	Impossible to read zip files in NetworkReader
4307	More memory leaks for 3.7
4042	Log file location is currently only accessible via an implementation-specific config param
4296	Node Fill style sheet offers palettes in addition to colors
4145	Editing A Table Cell Causes Text To Be Obsured
4100	Show Tool Panel
3635	cyREST does not accept size (height) parameter for SVG image generator API Trying to open a Session File(.cys) without a file extension fails without an error dialog
4074	
4106	Error creating new Network/View programmatically
3941	Performance: Improve selection performance
3937	CyTable.countMatchingRows() doesn't work property for virtual column
4085	Label Position UI
4202	Startup performance made worse by AppParser.getChecksum()
4235	Annotation factory performance
4179	CX Export throws NullPointerException when no graph view is selected Add overload of AbstractCyActivator.registerServiceListener() that takes method references
3827	
4239	Create a selection event
4221	Toolbar separator not removed on app uninstall/reinstall
3966	Performance: batch API for adding/removing annotations

4098 Pathway Commons link out of date
4225 Select Edges Only - deselects nodes, but not really
4104 "Arrange Network Windows" menu item should be removed
3858 Update edge commands to 3.6 API
4160 Network/Table import should support local columns
4217 ConcurrentModificationException in table browser
4283 Default palette for sequential data
4196 Command line parameter -R is persistent across instances
4046 JSON for Cytoscape columns doesn't include listType
4204 Remove CytoPanelName.BOTTOM from API
4241 Trying to open chart editor on enrichmentmap network fails
3339 Empty column filter under topology filter can be very slow.
4223 Don't fire RowsSetEvent if value didn't change
4234 Memory leak in network panel
3989 using OpenBrowser in a task can deadlock the UI
4228 Memory leak in CyEventHelper
3331 Topology filters select nodes one by one, causing redraws
4078 Cytoscape 3.7.0-SNAPSHOT is much slower to start
4278 Resizing Grouped Annotations
4139 enrichmentmap
3955 Cytoscape locks a file that is imported
4279 Manifest package list parser improperly handles version range
4155 CyNDEx-2 jar contains platform-specific support
4256 ConcurrentModificationException in CyAnnotator
4152 Ugly Cytoscape Application icon in Ubuntu
4167 ESCAPE key closes Task Monitor without cancelling the task
4016 Blocking error dialog if checking latest Cytoscape version when offline
4218 Session loading performance problem in CSVCyReader.parseValue()
4216 proxy window not displaying controls for user and password
4215 PDM:Trojan.Win32.Generic
4212 Unable to load networks
4206 app download notworking
4205 Duplicate File>Import>File... menu actions
4201 trojan.win32.generic
4184 bioinformation
4183 bioinformation
4175 apps won't load
4169 Do not start
4168 Merge long time
4157 Cannot access installed Java 8
4151 Can't run cytoscape
4146 flash
4144 Check for update causes an empty dialog box to appear.

4138 numbers of proteins
4137 numbers of proteins
4125 JSON example for apps/status command doesn't match output case
4124 Some app commands have invalid JSON as examples.
4119 network/get gets current when name does not exist
4118 set properties misses Implementation Notes in swagger
4117 set_attribute misses Implementation Notes in swagger
4086 Zoom in using trackpad
4080 can't export excel
4077 Crash when zooming
4070 Retrieve list of organism from wikipathway
4065 Fail to connect server
4050 12/27/17
4045 Proxy Menu doesn't display
GroupAnnotation addMember method should add the annotation to the manager
if it isn't already
4040
4029 Apps installation errors
4023 Select nodes from id list file
4018 problem solved!
4017 Cannot import kgml to Cytoscape
4012 String does not appear in Search Bar
3980 Annotations sometimes show up in the wrong place
3968 menu disappears
3962 Commands parameters should always be Lower Camel Case
3957 select function
3896 cannot connect
3764 Style window loads and hangs everytime
3072 freezing
2995 Filter min/max values outside column range not preserved on session save/restore
4069 Cryptic message box when Check for Updates doesn't have a network connection
4068 Cryptic error box when Cytoscape starts without network
4033 NPEs thrown by Diffusion app
4022 Diffusion app should not open a results panel by default
4009 CyNDEx2 imported view is not centered, subnetwork node locations are not saved
4007 Creating a new network via the Diffusion Results panel fails to lay out new network
4005 Running Diffusion on Yeast Genetic Interactions throws NPE
3867 Table Panel does not complete/cancel cell editing when switching edges
3184 Bugs with importing public databases
2740 Function builder doesn't work if column name begins with a number
2064 Print landscape fail
4052 GraphML file export
3146 listenForChange Tunable parameter doesn't always work
4187 Event coalescing and selection event
4115 Label Position display bug

- 3903 Very long network title causes session loading to crash
- 4025 Proxy settings: http form disappears
- 3859 The group commands need to be converted to use the 3.6 API
- 4041 CyUserLog isn't accessible via java.util.logging
- 4095 node set properties does not lock-in bypass values
Changing the canvas or ZOrder of a GroupAnnotation should change the canvas
and ZOrder of all of it's children
- 4053