

November 15, 2017

## Welcome

### Summary

- Cytoscape v3.6 is now available for immediate download.
- Addresses 104 issues relative to v3.5.1 (see Section 10)
- Significant upgrades to core functionality (top 5)
  - Cytoscape Automation
  - yFiles Update
  - Network Search Bar
  - Starter Panel & New Starter Networks
  - Diffusion
- 13 more Apps are available in the App Store as compared to the v3.5.1 release.
- Ready for use by all segments of the Cytoscape community.
- Continues v3.6's core feature set, specifically:
  - Upward compatible and can coexist with previous Cytoscape versions
  - Most popular plugins from v2.x versions are available as apps, with more to follow.
- What to do next ...

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

### Dear Cytoscape User

We are proud and pleased to release Cytoscape v3.6. 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.*

*v3.6 retains support for 32 bit JVMs and Windows XP, as they are a significant portion of Cytoscape installations. However, certain features of Cytoscape may not function with 32 bit JVMs.*

*v3.6 fully supports Java 8, but not Java 7 or 9.*

This release marks successful tests with the system configurations most common among our user base, including 35 different combinations of operating systems and Java Virtual Machines across Windows, Linux, and Mac OS platforms. Check out your system's configuration here: <http://tinyurl.com/ybp39srw>.

Finally, in v3.6, 13 Apps were added to the App Store (<http://apps.cytoscape.org>), bringing the total to 201. The apps new for v3.6 include:

AnatApp	Cytoscape Neo4j Plugin	PolyLayout
AOPXplorer	HGPEC	Tetramer
CoordinatesLayout	InformationAnalyzer	TMM
CyLinkPredictor	InsituNet	
CytoCtrlAnalyser	MetaNetter_2	

We expect to make a v3.6.1 release in early 2018, and it will address Java 9. We also expect a v3.7 release in mid Q2 2018. 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
<b>New</b>	<b>For New Users</b> (Section 1)
<b>Casual</b>	<b>For Casual Users</b> (Section 2)
<b>Power</b>	<b>For Power Users</b> (Section 3)
<b>App Developers</b>	<b>For App Developers</b> (Section 4)
<b>General Interest</b>	Try getting oriented by reading: <b>General Background</b> (Section 5) <b>Cytoscape App Store</b> (Section 6) Then try browsing: <b>New Features</b> (Section 7) <b>Support Offering</b> (Section 8) <b>Future Plans</b> (Section 9) To get your feet wet, try: <b>For New Users</b> (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 (the newest version). v2.x has been in the field for several years and is now out of support. Cytoscape v3.6 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 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 users, the JVM commonly installed is a 32 bit version, even if the Windows itself is 64 bits. ***For Cytoscape use, the 64 bit version is highly recommended instead.*** For all workstations, Java 8 is required.

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 RC version, *please uninstall it before proceeding*. Previous Cytoscape versions can coexist with v3.6, 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
- ***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?

Cytoscape v3.6 requires Java 8, preferably with 64 bit support. 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.

Note that v2.x plugins do not work with v3.x. In order to get the benefits of improved stability, the Cytoscape team found it necessary to change the relationship between plugins/apps and the Cytoscape core. Many plugins have been ported to v3.x (see Section 6). The porting exercise is substantial, and once a plugin is converted to an app, it will continue to work at least until v4.0 is released – there is no v4.0 planned at this time. For more on this topic, see:

[http://wiki.cytoscape.org/Cytoscape\\_3/CoreDevelopment/Motivation](http://wiki.cytoscape.org/Cytoscape_3/CoreDevelopment/Motivation)

### 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:

[http://wiki.cytoscape.org/Cytoscape\\_3/AppDeveloper/Cytoscape\\_App\\_Ladder](http://wiki.cytoscape.org/Cytoscape_3/AppDeveloper/Cytoscape_App_Ladder)

To convert a v2.x plugin to a v3.x app, refer to:

[http://wiki.cytoscape.org/Cytoscape\\_3/AppDeveloper/PluginPortingGuide](http://wiki.cytoscape.org/Cytoscape_3/AppDeveloper/PluginPortingGuide)

or

<http://f1000research.com/articles/3-150/v1>

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

[http://wiki.cytoscape.org/Cytoscape\\_3/CoreDevelopment](http://wiki.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](http://opentutorials.cgl.ucsf.edu/index.php/Tutorial:Creating_a_Simple_Cytoscape_3_App)

Also note the App Cookbook:

[http://wiki.cytoscape.org/Cytoscape\\_3/AppDeveloper/Cytoscape\\_3\\_App\\_Cookbook](http://wiki.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 framework<sup>1</sup>. 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.

---

<sup>1</sup> [www.osgi.org](http://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
<b>New or Casual</b>	Find Cytoscape functionality easy via familiar paradigms of search and tag navigation
<b>Power or Frequent</b>	Find and install apps easy and provide crowdsourced rating and reviews
<b>App Developers</b>	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
<b>Cytoscape Automation</b>	Power users	24. Cytoscape Automation
<b>yFiles Update</b>	All users	11.7 yFiles Layouts
<b>Network Search Bar</b>	All users	5.3 Import Networks from Public Databases
<b>Starter Panel</b>	All users	4.1 Starter Panel
<b>New Starter Networks</b>	New users	
<b>CyBrowser Integration</b>	All users	<a href="http://apps.cytoscape.org/apps/cybrowser">http://apps.cytoscape.org/apps/cybrowser</a>
<b>Drag &amp; Drop sessions, networks &amp; tables</b>	All users	5.1 Import Fixed-Format Network Files
<b>Diffusion</b>	All users	10.3 Diffusion
<b>Copycat Layout</b>	Power users	11.6 Automatic Layout Algorithms
<b>Unattended Installation</b>	Power users	2.2 Getting Started
<b>High Sierra Support</b>	All users	
<b>Improved Selection Performance</b>	All users	
<b>Toolbar Customization</b>	Power users	4.2 Basic Features

## 8. Support Offering Table

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

## 9. Future Plans Table

Feature	Purpose	Beneficiary	Timeframe
<b>Distributed computing</b>	Link to NDEx and other external storage and compute services	All users	Ongoing
<b>Additional Visualizations</b>			Ongoing
<b>Additional Analytics</b>			Ongoing
<b>Wallpaper Collection</b>	Publicize good results associated with Cytoscape	All users, potential users, general public	TBD
<b>Cytoscape Clinics</b> 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 v3.6. Details for each issue can be found at Cytoscape's RedMine issue repository:

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

Issue	Description
1694	"selected" column isn't correctly set when session is loaded
1701	Support loading of adjacency matrix files
1705	UI: "Delete Annotation" incorrectly placed in network context menu
2025	Import Network/Table From Web Service - on the Toolbar
2487	Default visual style doesn't always appear the same when importing SIF file.
2494	Programatically change the size of edge arrowhead
2592	Improve curb appeal of main and Welcome windows
2618	Pasted edge selection state out of sync
2806	Position Annotations relatively
2935	Tunables: Provide a way of hiding the Group label
3103	Make Control Panel more accessible when installing lots of Apps
3104	Support adjacency matrix
3112	Internal logging should utilize CyUserLog
3114	Incremental node layout
3133	Toolbar should be customizable
3301	Remove pre-java-5 dependencies (org.jdesktop.layout)
3384	Remove duplicated edges -> doesn't delete duplicated self edges
3387	Improvement in Command scripting
3416	Confusing wording on Welcome screen
3508	[JSON Support] Edge Color Discrete Mapping will not be created when "Color (Unselected)" is used for VP
3522	Some default linkouts are broken or questionably composed
3527	Could the shaded area in the birdseye view be manually resized to control zoom?
3535	News feed links in Welcome Screen should work
3553	CyREST doesn't update stale reference if JSON core app updated
3585	Column filters should have more options for List columns
3615	style JDialogTaskManager does not die and shows no info if a task throws a Throwable that isn't an
3623	Exception
3632	Network Merge - intersection not including undirected edges found in both networks
3695	GML reader fails with duplicate lables
3697	Import->Ontology and Annotation... is completely broken
3712	GML NetworkReader bypasses all labels
3714	CyTableImpl.deleteRows() is very slow
3728	An exception in a getter for a ListSingleSelction @Tunable is always masked by an unhelpful message CyActions are not unregistered from menu events when a bundle is unloaded, leading to
3733	exceptions
3747	Recursion in PartitionUtil.traverse() can cause StackOverflowError
3748	DialogTaskManager should catch Throwable from running Tasks

3758 Improve memory usage of CyTableImpl  
3759 Long file name in recent files list causes Welcome screen become very wide.  
3772 GenerateNetworkViewsTask overwrites style of views -- pull request #4  
3782 Shortcut for full screen  
3787 Cloning a network has bad interactions with table import  
3788 Export Web Pages fail to display  
3791 Agilent Lit. Search  
3795 Impossible to regenerate handlers for Object with @Tunables  
3798 Recast the Welcome Screen as a Starter Panel  
3799 Command Line Dialog no longer updates after Clear  
3804 typo in release notes  
3805 BisoGenet  
3812 RecentSessions lost, Welcome screen lost when recent file has Chinese characters  
3814 Read Session File Error  
3817 Arrow shape names documented incorrectly and new arrows should be supported  
3824 Group expand/collapse bug  
3825 FileUtil API should support browsing for folders  
3826 Switching sessions is slow  
3829 Network Search Widget  
3831 Previous view loses its style after setting another current view  
3832 Multiple unnecessary view updates when modifying visual mappings  
3833 Performing Clear Errors on a table cell having an error equation will clear the whole column  
Floating point columns in tables need a formatting feature to achieve predictable numeric  
3834 appearances  
3836 UserAction.setActionListener() does not enable action/button  
3838 restoreEdge bug  
3840 Command parsing of ListMultipleSelection tunables is broken  
3843 Drag & Drop network files onto a Collection  
3852 Can't install  
3853 unable o update apps  
3855 Pathway Studios Node and Interaction Sheets Network import app  
3857 Update 'command' commands to 3.6 API  
3860 The network commands need to be converted to use the 3.6 API  
3861 The node commands need to be converted to use the 3.6 API  
3862 The session commands need to be converted to use the 3.6 API  
3864 The view commands need to be converted to use the 3.6 API  
3865 The vizmap commands need to be converted to use the 3.6 API  
3866 The layout commands need to be converted to use the 3.6 API  
VisualPropertyDependency.setDependency() doesn't update views when used  
3872 programmatically  
3874 Resetting of node layout scale  
3878 Control Panel's upper panels not resized when Tool Panel is resized down  
3879 Image annotations gone after session restore  
3886 Updates and fixes to Table Export  
3889 Add network/image export options to network context menu  
3890 selection performance improvement  
3893 Loading network from URL containing HTTP gives "URI scheme is not 'file'"

3894 Load network command doesn't work in CyBrowser  
3899 Performance improvements in 3.6  
3901 Change default gradient colors  
3904 Very long network title causes session loading to crash  
3906 Remove use of org.cytoscape.app from sample apps and cookbook examples  
3911 can not run genemania  
3917 Question  
3918 Question  
3919 EXCEL export empty  
3921 Error choosing json format when exporting styles  
3922 guide-bug  
3923 After generating empty network to capture Tunable annotations, the welcome panel disappears  
3935 yFiles layouts should not be available via automation  
3939 Annotations don't save into background canvas  
3949 Table browser selection in "Show all" mode is inconsistent  
3950 Some menu items not disabled when they should be  
3967 Menu bar missing  
3971 command echo with no variableName results in an NPE  
3976 Diffusion needs Cytoscape3 property for service URL  
3977 CyBrowser commands should use 3.6 API  
3978 Duplicated "Create Views" menu item  
3982 table rename column command doesn't appear  
3990 ArrayIndexOutOfBoundsException after loading session with DyNetViewer installed