

# **2022 ROS**

# **Metrics Report**

**Katherine Scott & Tully Foote**

# Contents

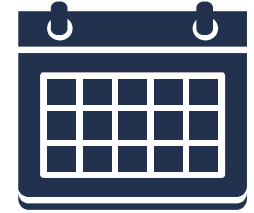
- Awareness Metrics
- Membership Metrics
- Engagement Metrics
- Code Metrics



1.

# Awareness Metrics

Discovering the community, learning more about it and potential community members.



# ROS.org Metrics

- Generally we use July as our benchmark month for ROS data.
- Some metrics use the most recent data available.
- Where possible we show annual data and year over year data.

All Users  
100.00% Users

+ Add Segment

Jul 1, 2022 - Jul 31, 2022

### Overview

Users vs. Select a metric

Hourly Day Week Month



Users

56,502

New Users

32,445

Sessions

176,233

Number of Sessions per User

3.12

Pageviews

579,078

Pages / Session

3.29

Avg. Session Duration

00:05:39

Bounce Rate

45.84%



# docs.ros.org

## New ROS 2 documentation

We believe that the ROS 2 Docs  
are absorbing traffic from the  
ROS Wiki

ROS™

All Users  
100.00% Users

+ Add Segment

Jul 1, 2022 - Jul 31, 2022

Overview

Users vs. Select a metric

Hourly Day Week Month



Users

56,502

New Users

32,445

Sessions

176,233

Number of Sessions per User

3.12

Pageviews

579,078

Pages / Session

3.29

Avg. Session Duration

00:05:39

Bounce Rate

45.84%

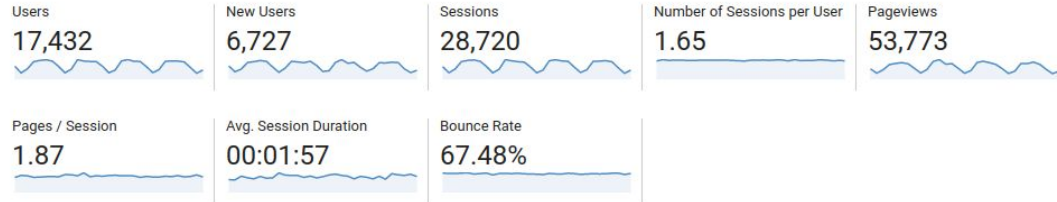
# docs.ros.org

## New ROS 2 documentation

## Overview

Users vs. Select a metric

Hourly Day Week Month



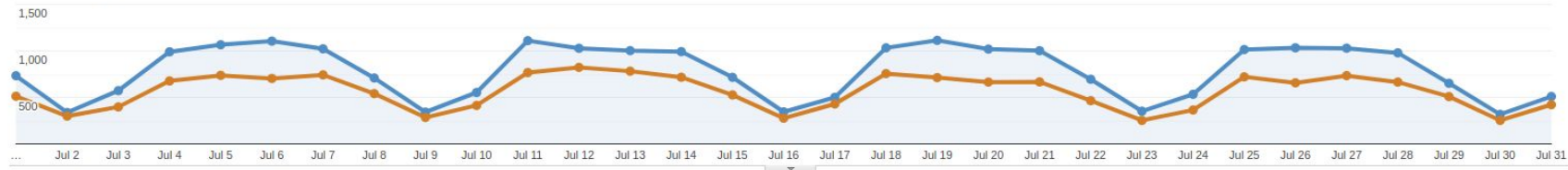
# index.ros.org

ROS Index lists all the ROS 1 & ROS 2 Packages



Jul 1, 2022 - Jul 31, 2022: ● Users

Jul 2, 2021 - Aug 1, 2021: ● Users



Users

**33.31%**

17,432 vs 13,076



New Users

**-1.41%**

6,727 vs 6,823



Sessions

**41.61%**

28,720 vs 20,281



Number of Sessions per User

**6.22%**

1.65 vs 1.55



Pageviews

**34.20%**

53,773 vs 40,069



■ Returning Visitor ■ New Visitor

Pages / Session

**-5.23%**

1.87 vs 1.98



Avg. Session Duration

**3.77%**

00:01:57 vs 00:01:53



Bounce Rate

**0.71%**

67.48% vs 67.01%



# index.ros.org

Total users up 33.31% \* year-over-year

ROS™



# 2.

## Membership Metrics

Those who sign up to join the community



## 8347 Discourse Users

+9.8% Since 2021



## 14,689 Wiki Users

17,181 in 2021, -14.50%

Sampled on 12/15/2021, 12/14/2022 from Google Analytics



## 5,689 ROS Answers Users

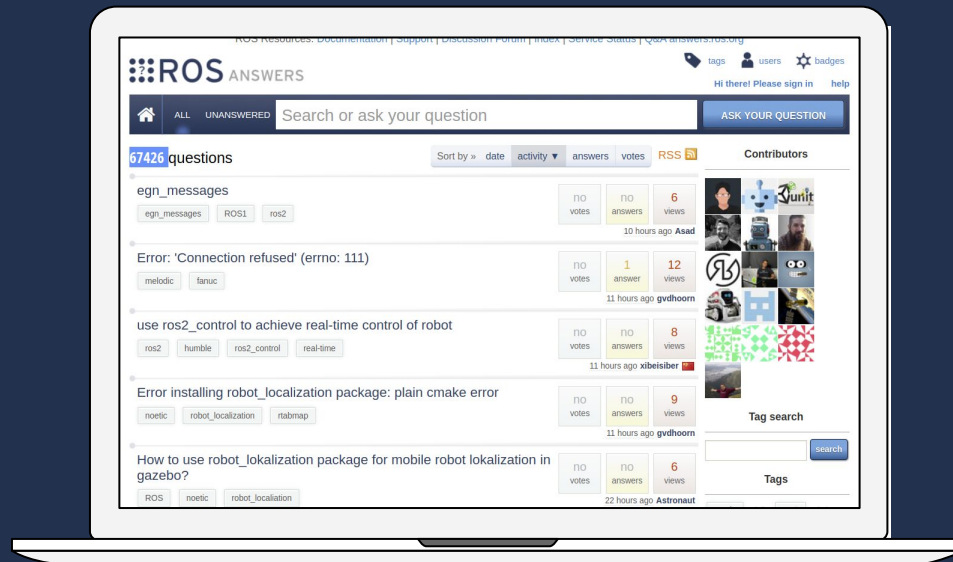
6,406 in July 2021, -11.19%

Sampled for July, 2022. Daily active users via Google Analytics,

# ROS Answers

ROS Q&A Website.

In 2022 we announced the service was moving to Stack Exchange



ROS



## 67,427 Questions Asked

As of 12/12/2022. +6.4% since 1/2022 (63,356)



## 43,494 Questions Answered

37,590 in 7/2021, +15.7%



## 434 Questions Asked July 2022

617 in July 2022, -29.6% since 2021

All Users  
100.00% Users

+ Add Segment

Jul 1, 2022 - Jul 31, 2022

Overview

Users vs. Select a metric

Hourly Day Week Month



Users

137,075

New Users

94,068

Sessions

386,084

Number of Sessions per User

2.82

Pageviews

726,709

Pages / Session

1.88

Avg. Session Duration

00:04:44

Bounce Rate

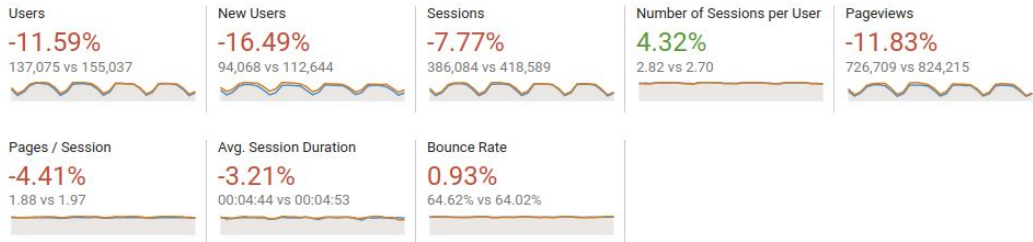
64.62%

# answers.ros.org

Community Support Forum

ROS™

Jul 1, 2022 - Jul 31, 2022: ● Users  
Jul 2, 2021 - Aug 1, 2021: ● Users



In 2022 we announced the service was moving to Stack Exchange.

We believe much of this traffic has redirected to Reddit and Stack Exchange

# answers.ros.org

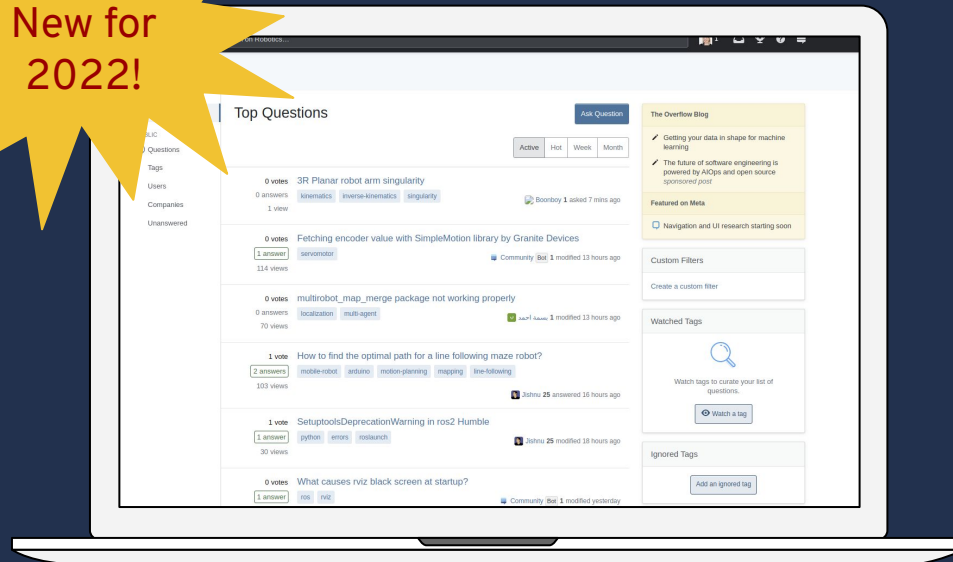
Total users down -11.59%

ROS™

# Robotics Stack Exchange

In 2022 we announced the service was moving to Stack Exchange

New for 2022!





**6,430 Questions Asked**

As of 1/4/2023



**24,192 Robotics Exchange Users**

As of 1/4/2023



**941 Unanswered Questions**

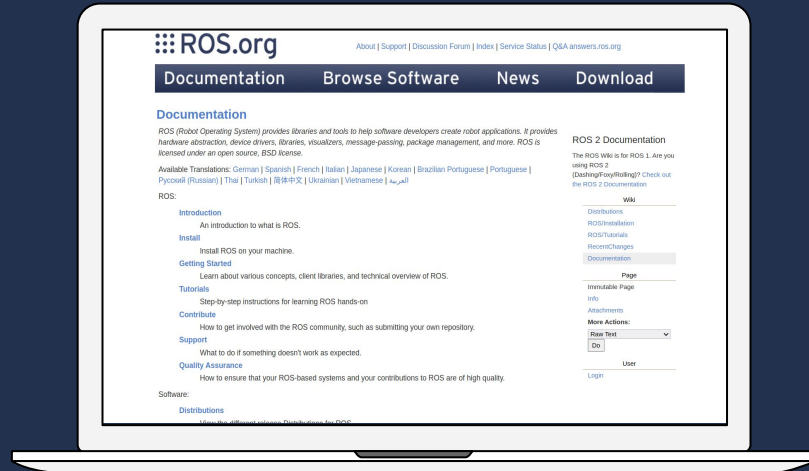
Unaccepted or unanswered as of 1/4/2023.

14.63% of all questions



# ROS Wiki

## Knowledgebase for ROS 1 information





## 17818 Wiki Pages

As of 1/06/2023. +2.9% since 1/28/2022 (17,320)



## 7.5 Wiki page edits per day

As of July 2022 vs 5.5 in July 2021, +30%



## 19,375,664 Page Views in 2022

23,151,780 in 2021 -16.31%

All Users  
100.00% Users

+ Add Segment

Jul 1, 2022 - Jul 31, 2022

Overview

Users vs. Select a metric

Hourly Day Week Month



Users  
194,963

New Users  
120,582

Sessions  
592,267

Number of Sessions per User  
3.04

Pageviews  
1,515,187

Pages / Session  
2.56

Avg. Session Duration  
00:05:11

Bounce Rate  
54.75%

# wiki.ros.org

## Daily Users per Google Analytics

ROS™

Jul 1, 2022 - Jul 31, 2022: ● Users

Jul 2, 2021 - Aug 1, 2021: ● Users



Users

-5.46%

194,963 vs 206,233



New Users

-11.78%

120,582 vs 136,681



Sessions

-12.56%

592,267 vs 677,379



Number of Sessions per User

-7.51%

3.04 vs 3.28



Pageviews

-19.71%

1,515,187 vs 1,887,231



Pages / Session

-8.18%

2.56 vs 2.79



Avg. Session Duration

-8.97%

00:05:11 vs 00:05:41



Bounce Rate

5.45%

54.75% vs 51.92%



Wiki.ros.org only contains ROS 1 content, we anticipated declines due to the ROS 2 transitions

# wiki.ros.org

-5.46% Growth year-over-year in daily users

ROS™

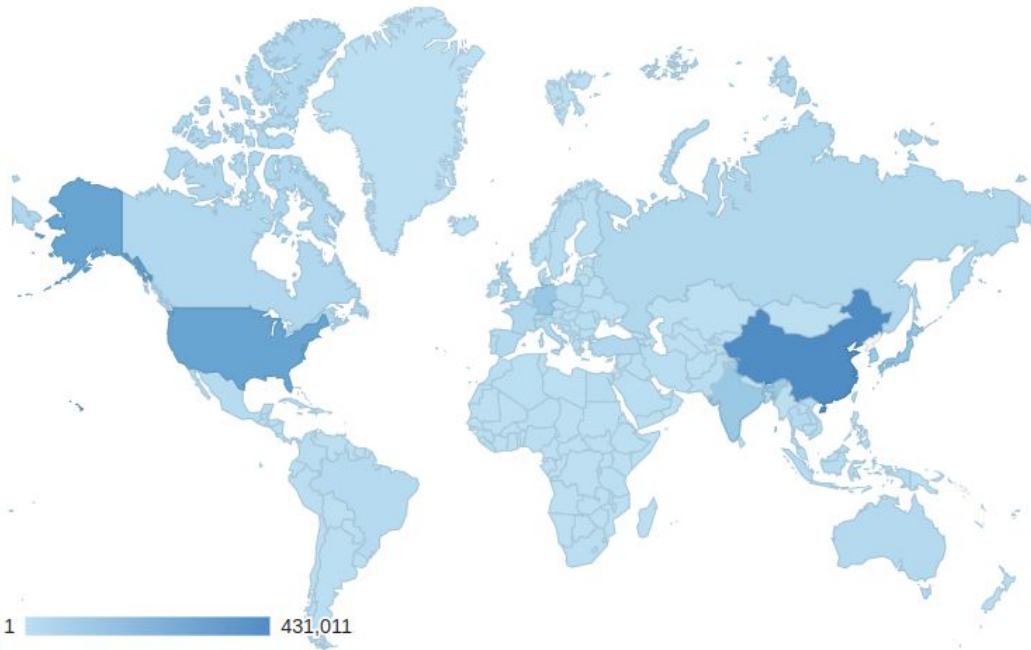
<input type="checkbox"/>	User Type <sup>?</sup>	Acquisition			Behavior		
		Users <sup>?</sup> ↓	New Users <sup>?</sup>	Sessions <sup>?</sup>	Bounce Rate <sup>?</sup>	Pages / Session <sup>?</sup>	Avg. Session Duration <sup>?</sup>
		5.46% ↓ 194,963 vs 206,233	11.80% ↓ 121,056 vs 137,250	12.56% ↓ 592,267 vs 677,379	5.45% ↑ 54.75% vs 51.92%	8.18% ↓ 2.56 vs 2.79	8.97% ↓ 00:05:11 vs 00:05:41
<input type="checkbox"/>	1. New Visitor						
	Jul 1, 2022 - Jul 31, 2022	120,923 (51.23%)	121,056 (100.00%)	121,056 (20.44%)	61.50%	2.29	00:03:21
	Jul 2, 2021 - Aug 1, 2021	134,674 (52.86%)	137,250 (100.00%)	137,250 (20.26%)	59.04%	2.45	00:03:33
	% Change	-10.21%	-11.80%	-11.80%	4.16%	-6.36%	-5.99%
<input type="checkbox"/>	2. Returning Visitor						
	Jul 1, 2022 - Jul 31, 2022	115,133 (48.77%)	0 (0.00%)	471,211 (79.56%)	53.02%	2.63	00:05:39
	Jul 2, 2021 - Aug 1, 2021	120,120 (47.14%)	0 (0.00%)	540,129 (79.74%)	50.12%	2.87	00:06:14
	% Change	-4.15%	0.00%	-12.76%	5.79%	-8.54%	-9.33%

# wiki.ros.org

New users down 11.8%

Wiki.ros.org only contains ROS 1 content, we anticipated declines due to the ROS 2 transitions





# wiki.ros.org

Traffic volume by country

Country	Acquisition	
	Users	
	291,342	% of Total: 100.00% (291,342)
1. United States	51,149	(16.88%)
2. China	47,317	(15.62%)
3. Germany	23,336	(7.70%)
4. Japan	20,908	(6.90%)
5. South Korea	17,076	(5.64%)
6. India	15,847	(5.23%)
7. United Kingdom	7,067	(2.33%)
8. France	6,653	(2.20%)
9. Taiwan	6,593	(2.18%)
10. Hong Kong	6,483	(2.14%)
11. Canada	6,189	(2.04%)
12. Italy	5,932	(1.96%)
13. Singapore	5,651	(1.86%)
14. Spain	5,009	(1.65%)
15. Russia	4,964	(1.64%)
16. Turkey	4,683	(1.55%)
17. Netherlands	4,580	(1.51%)
18. Australia	4,239	(1.40%)
19. Brazil	3,860	(1.27%)
20. Thailand	3,620	(1.19%)

ROS™

# Public Wiki Mirrors Not Included



## Asia

Singapore, China, Tokyo, Japan, Ho Chi Minh, Vietnam

## North America

College Park, Maryland, Saint Louis, Massachusetts, Potsdam, New York

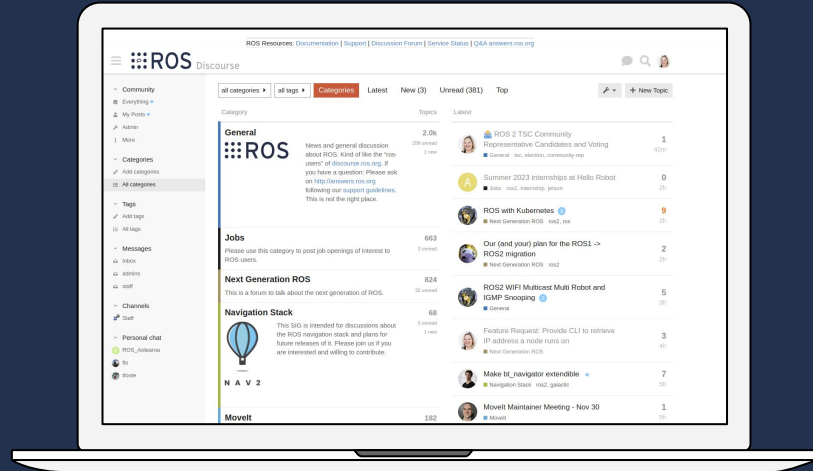
## Europe

Ireland, Freiburg, Germany, Barcelona, Catalonia

## South America

Sao Paulo, Brazil

# ROS Discourse ROS Community Discussion Forum





## 2022-01-07

	Last 24 hours	Last 7 days	Last 30 days	All Time
Topics	4	20	72	6.1k
Posts	39	223	834	55.6k
Users	8	58	210	7.6k
Active Users	200	557	928	—
Likes	29	144	675	30.5k

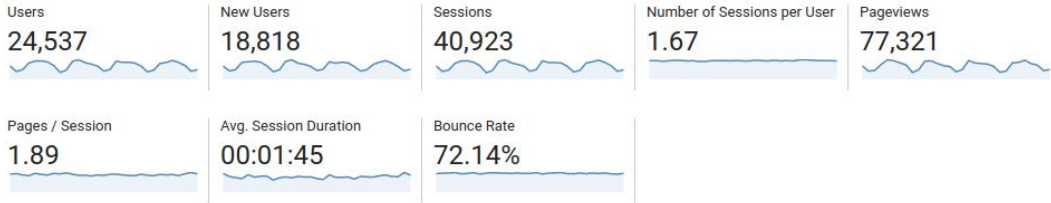
## 2022-12-12

	Last 24 hours	Last 7 days	Last 30 days	All Time
Topics	3	22	103	7.1k
Posts	18	166	917	64.6k
Sign-Ups	3	37	172	8.3k
Active Users	200	501	930	—
Likes	14	139	653	37.5k
Chat Messages	3	10	41	216

# ROS Discourse



	Jan 2022	Dec 2022	Change
Topics	<b>72</b>	<b>103</b>	<b>43%</b>
Posts	<b>834</b>	<b>917</b>	<b>9.95%</b>
Active Users	<b>928</b>	<b>930</b>	<b>0.22%</b>
Likes	<b>675</b>	<b>673</b>	<b>-0.3%</b>



# discourse.ros.org

Total users down -9.10% year-over-year



Jul 1, 2022 - Jul 31, 2022: ● Users

Jul 2, 2021 - Aug 1, 2021: ● Users



Users

**-9.10%**

24,537 vs 26,994



New Users

**-7.71%**

18,818 vs 20,391



Sessions

**-7.74%**

40,923 vs 44,358



Number of Sessions per User

**1.49%**

1.67 vs 1.64



Pageviews

**-1.87%**

77,321 vs 78,798



Pages / Session

**6.36%**

1.89 vs 1.78



Avg. Session Duration

**3.58%**

00:01:45 vs 00:01:42



Bounce Rate

**-0.58%**

72.14% vs 72.56%

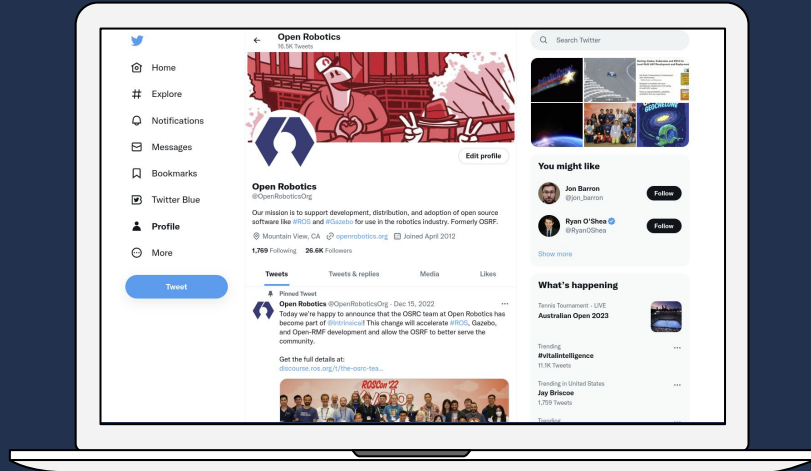


# discourse.ros.org

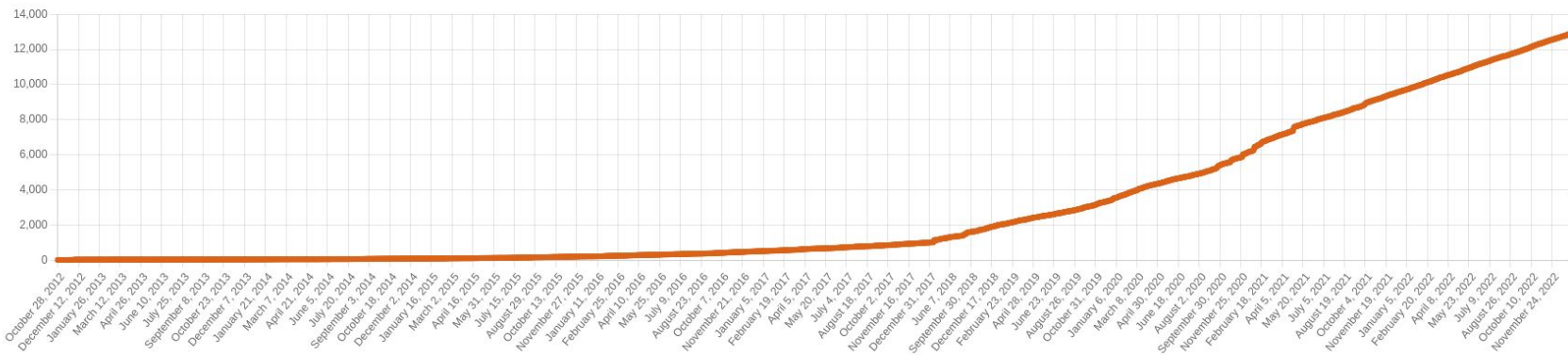
Total users down -9.10% year-over-year

ROS™

# ROS on Social Media Spreading awareness of the project.



Graph of subscribers / posts / comments



# reddit.com/r/ROS

Consistent growth, meeting community where they're at.

Taken 1/6/2022. Graph from socialrise.com

## About Community

This subreddit is for discussions around the Robot Operating System, or ROS.

Created Oct 26, 2010

12.9k

ROS  
developers

30

turtle aficionados here  
now


Top 5%

Ranked by  
Size

ROS™

# LinkedIn

## Visitor metrics

Unique visitors 

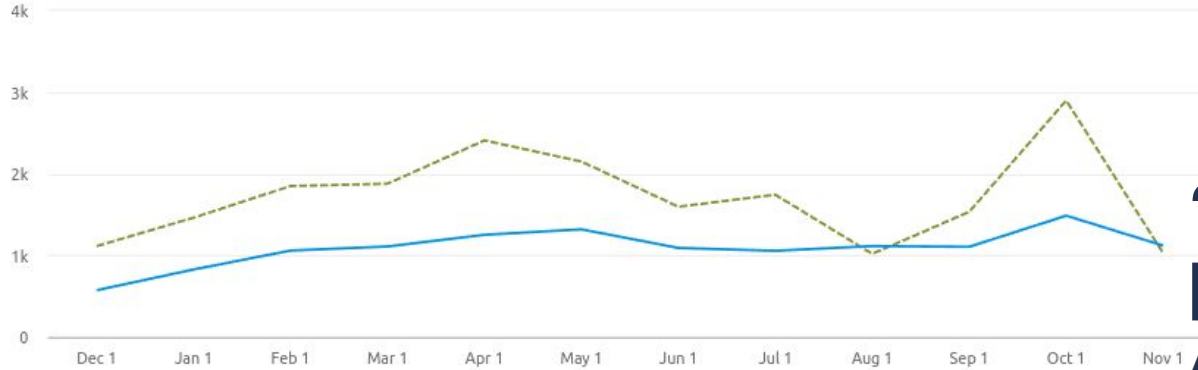
All pages 

All filters

96,116  
Page views  
▲ 1,585.7%

33,631  
Unique visitors  
▲ 1,517.7%

1,344  
Custom button clicks  
▲ 663.6%



**~70,000  
Followers  
As of 12/2022**

Desktop

13,111

Mobile

20,673

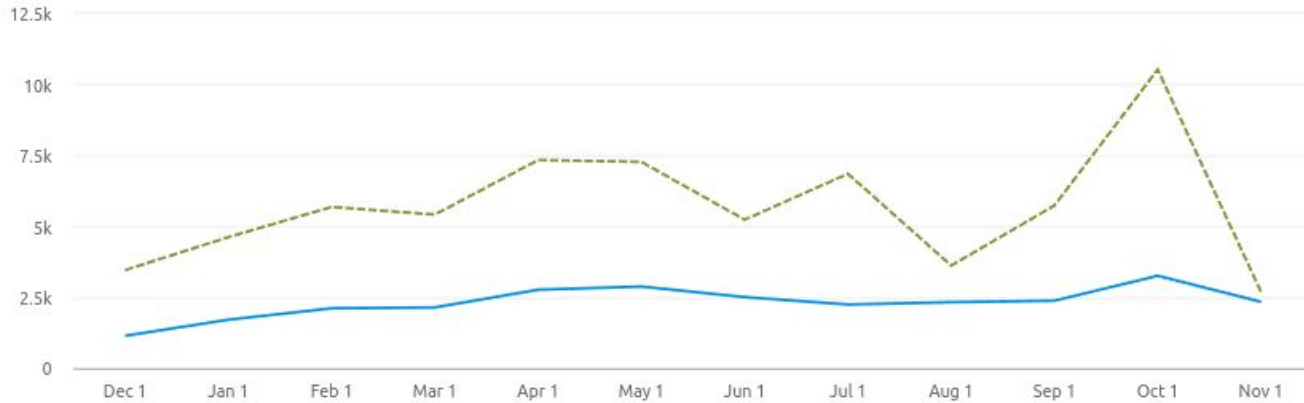
# LinkedIn

Visitor metrics [?](#)

Page views ▾

All pages ▾

All filters



✓ Desktop

27,743

✓ Mobile

68,373



# @ROSOrg Twitter

Dec 2022 • 31 days

## TWEET HIGHLIGHTS

**Top Tweet** earned 3,162 impressions

Make your RVIZ more festive!  
twitter.com/probablydavid/...

13.7 25

View Tweet activity

View all Tweet activity

**Top Follower** followed by 48.9K people



**The 4th Wave AI**

@4thWaveAI

The 4th wave will be in Artificial Intelligence, Nanotechnology, Biotechnology, and Robotics. We focus on the latest NEWS & REVIEWS, #Technology #Science #AI

View profile

**Top mention** earned 265 engagements



**Ivano Malavolta**

@IMalavolta - Dec 18

Together with @michelalbonico and two of our best

@VUamsterdam students, we mapped #softwareengineering research on #ROS. Among others, there we also give action points for a better alignment between research and industry  
doi.org/10.1016/j.jss....

@rosorg @JSSoftware  
pic.twitter.com/VswLixEkR4



**Software engineering research on the Robot Operating System: A systematic mapping study**  
Ivano Malavolta, Michel Albonico, Wim Helder, Anas Mihalovic  
The Journal of Supercomputing, 2022

2 15 51

View Tweet

**Top media Tweet** earned 1,856 impressions

Congratulations @Fmrico!

The #ROS community has elected you to be the next ROS 2 Technical Steering Committee Community Representative!

Read all about the election on ROS Discourse:

## DEC 2022 SUMMARY

Tweets

12

Tweet impressions

18.1K

Profile visits

5,122

Mentions

82

New followers

141

~13,600  
Followers  
As of 12/2022



# @OpenRobotics Twitter

Dec 2022 · 31 days

## TWEET HIGHLIGHTS

### Top Tweet

earned 34K impressions

Today we're happy to announce that the OSRC team at Open Robotics has become part of @Intrinsicai! This change will accelerate #ROS, Gazebo, and Open-RMF development and allow the OSRF to better serve the community.

Get the full details at:  
[discourse.ros.org/t/the-osrc-tea...](https://discourse.ros.org/t/the-osrc-team-joins-intrinsicai/)  
[pic.twitter.com/OgbTsCPTWs](https://pic.twitter.com/OgbTsCPTWs)



4 39 108

View Tweet activity

View all Tweet activity

### Top Follower

followed by 15.2K people



Javelynn

@\_javelynn\_ (FOLLOWS YOU)

The Curated Tech Blog. Tag article links to retweet. Write for us.

### Top mention

earned 550 engagements

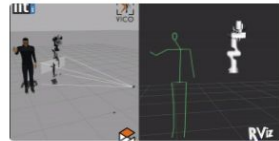


Juan M. Gandarias

@jmgandarias · Dec 23

Do you work in Human-Robot Interaction or Human Modelling? This may interest you! We have published Open-VICO, an open-source toolkit for Gazebo for human skeleton tracking.

paper: [arxiv.org/abs/2203.14733](https://arxiv.org/abs/2203.14733)  
code: [gitlab.lit.it/hrii-public/op...](https://gitlab.lit.it/hrii-public/op...)  
[@OpenRoboticsOrg](https://OpenRoboticsOrg) [@iitHri2Lab](https://iitHri2Lab)  
[@GazeboSim](https://GazeboSim) [pic.twitter.com/8j711161u](https://pic.twitter.com/8j711161u)



3 23 136

View Tweet

### Top media Tweet

earned 8,369 impressions

Congratulations @Fmrico!

The #ROS community has elected you to be the next ROS 2 Technical Steering Committee Community Representative!

Read all about the election on ROS Discourse:

## DEC 2022 SUMMARY

Tweets

23

Tweet impressions

84.9K

Profile visits

10.3K

Members

127

New followers

377

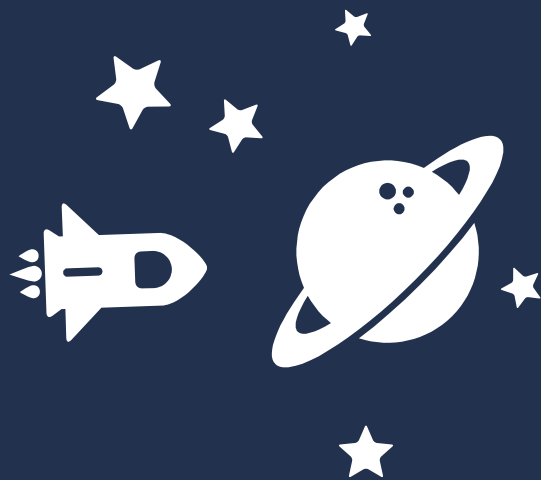
~26,600  
Followers  
As of 12/2022



# 3.

## **Distro, Package, and Download Metrics**

What we know about users



# ROS Package Downloads

Every year we sample download data from our servers at Oregon State University.

# October 2022

## Debs Downloads, Visitors, Packages



	October 2021	October 2022	YoY Change
<b>Total Unique Packages</b> (packages across versions, distros, syncs, etc)	<b>89,144</b>	<b>146,745</b>	<b>+64.62%</b>
<b>Different Packages</b>	<b>19,562</b>	<b>23,614</b>	<b>+20.71%</b>
<b>Deb Downloads</b>	<b>45,100,525</b>	<b>49,078,176</b>	<b>+8.82%</b>
<b>Unique Visitors</b>	<b>789,956</b>	<b>767,632</b>	<b>-2.82%</b>

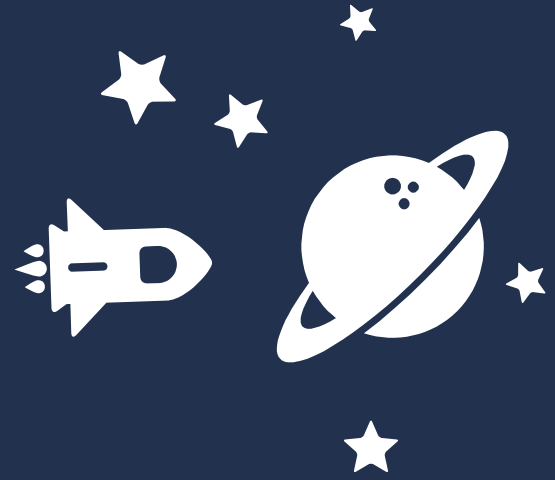
# 2022 Total

## Debs Downloads, Data, Packages



	2021	2022	YoY Change
<b>Total Packages</b> (packages across versions, distros, rebuilds, syncs, etc)	<b>441,338</b>	<b>434,629</b>	<b>-1.52%*</b>
<b>Different Packages</b>	<b>20,857</b>	<b>24,069</b>	<b>+15.4%</b>
<b>Deb Downloads</b>	<b>507,345,965</b>	<b>501,333,806</b>	<b>-1.18%*</b>
<b>Data Served (TB)</b>	<b>156.62</b>	<b>173.35</b>	<b>+10.68%</b>

\* The frequency of syncs / updates declined in 2022, accordingly the number of downloads is slightly lower.



# Distro Data

ROS usage data by version

# Distros by Year / Percentage

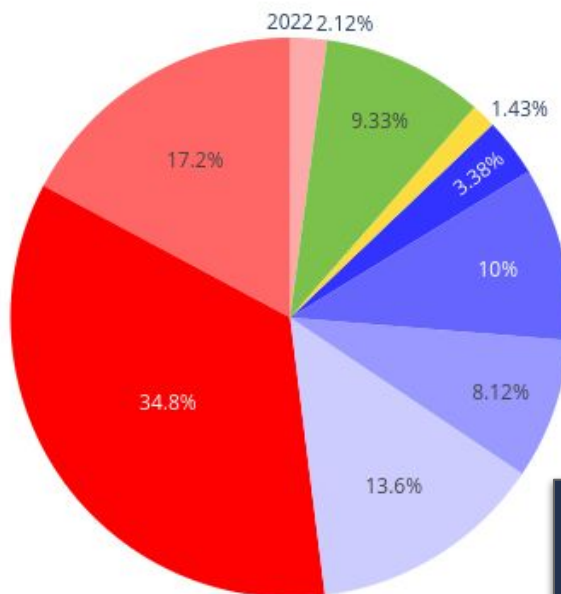
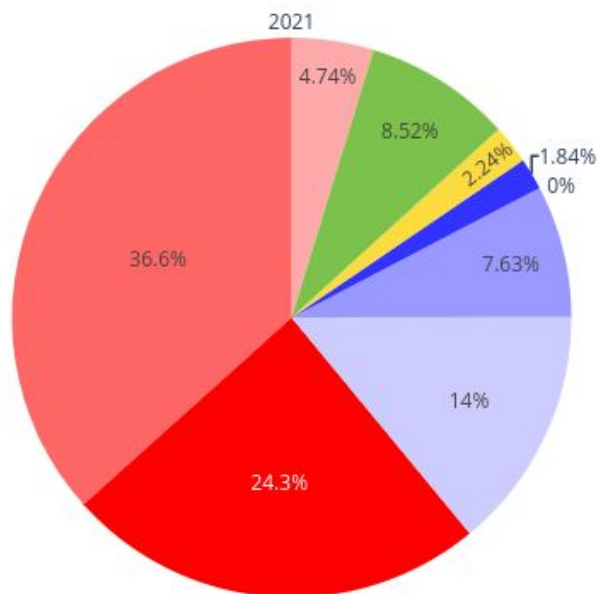


Distro	10/2021	10/2022	YoY Change
ROS 1 Kinetic	4.74%	2.62%	-2.62%
ROS 1 Melodic	36.64%	17.19%	-19.45%
ROS 1 Noetic	24.35%	34.80%	+10.45%
ROS 2 Humble	NA	10.04%	NA
ROS 2 Galactic	7.63%	8.12%	+0.49%
ROS 2 Foxy	14.04%	13.59%	-0.45%
ROS 2 Rolling	1.84%	3.38%	+1.54%
All other distros	2.24%	1.43%	-0.81%



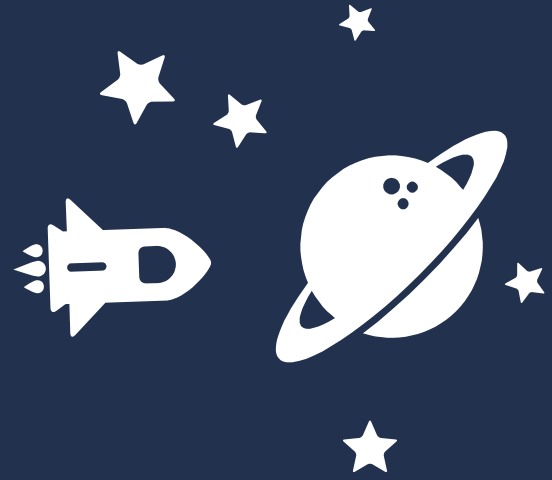
# Distro Download Stats

Download Percentage from packages.ros.org October 2021 vs October 2022



- kinetic
- melodic
- noetic
- foxy
- galactic
- humble
- rolling
- All Other Distros
- Python Pkgs

ROS.org metrics only.  
Does not include mirrors



# ROS by Version

What version of ROS is most used by the community?



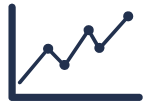
**47,070,071**

Total Packages Downloaded in October 2022



**43,806,035**

Total Packages Downloaded October 2021



**+7.45%**

Increase in total October package downloads year over year!



**501,333,806**

Approximate Number of Packages Downloads in 2022



All Package  
Downloads

 **ROS™**



**11,473,533**

ROS 2 Packages Downloaded in October 2021



**17,721,801**

ROS 2 Packages Downloaded October 2022



**+54.46%**

Increase in ROS 2 Packages Downloaded YoY



**212,000,000**

Annualized ROS 2 Packages Downloaded in 2022





**26,776,424**

ROS 1 Packages Downloaded in October 2022



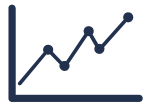
**17,721,801**

ROS 2 Packages Downloaded in October 2022



**39.82%**

ROS 2 as a Percentage of all ROS Downloads



**+12.02%**

Increase of ROS 2 Downloads

*In October 2021 27.81% of downloads were ROS 2.*



4.

# Source Code & Academic Metrics

Source code and citations



# 10,467

Citations of “ROS: an open-source Robot Operating System” (Quigley et al., 2009) on  
12/12/22.

**+13% Since January 2022**





# 48

Citations of “Robot Operating System 2: Design, architecture, and uses in the wild”  
(Macenski et al., 2022) on 12/12/22.





# 740+

## Companies Using ROS

Open Robotics maintains a list of companies using ROS culled from job listings, ROS Discourse posts, and other sources.

This isn't a definitive list, it is simply the companies we know about!



December 28, 2021 – January 28, 2022

Period: 1 month

### Overview

334 Active pull requests

7 Active issues

320

Merged pull requests

14

Open pull requests

5

Closed issues

2

New issues

Excluding merges, **75 authors** have pushed **320 commits** to master and **325 commits** to all branches. On master, **7 files** have changed and there have been **1,477 additions** and **413 deletions**.

The rostdistro is the repository where releases are managed and the main index of publicly announced ROS packages. Most pull requests on this repository are requests for indexing or packaging of ROS packages.

November 11, 2022 – December 11, 2022

Period: 1 month

### Overview

312 Active pull requests

1 Active issue

284

Merged pull requests

28

Open pull requests

0

Closed issues

1

New issue

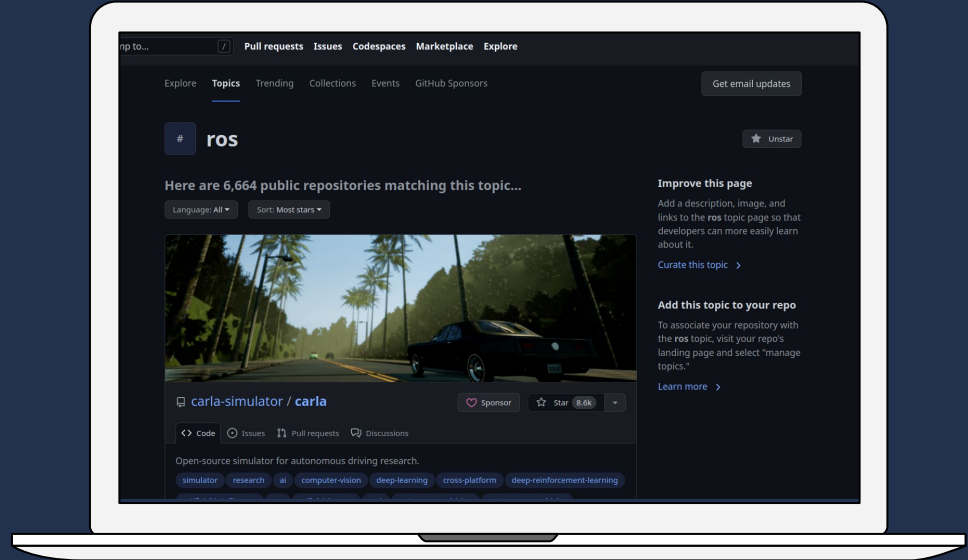
Excluding merges, **74 authors** have pushed **284 commits** to master and **286 commits** to all branches. On master, **10 files** have changed and there have been **1,250 additions** and **261 deletions**.



284 Pull requests merged by 68 people

# 6,664

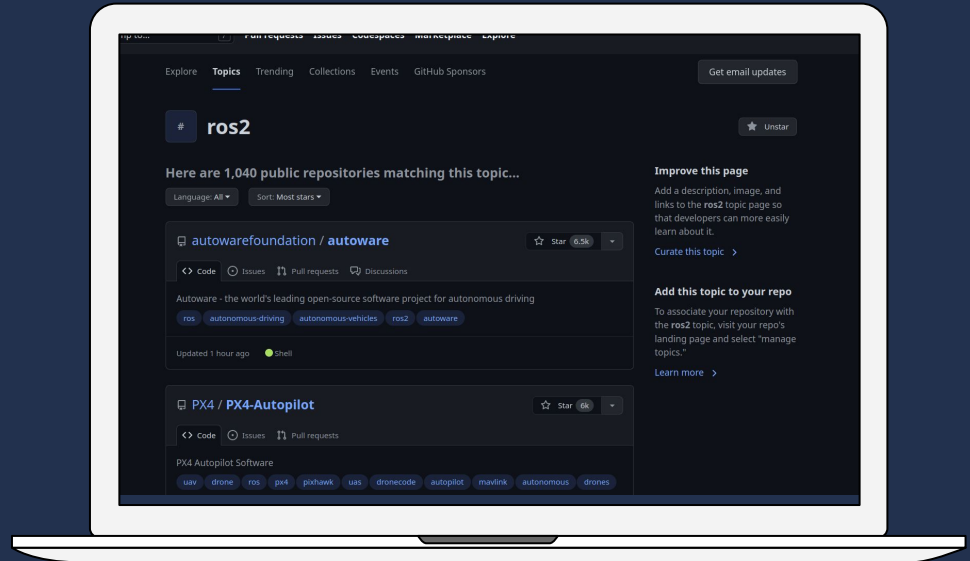
Number of Github  
repositories tagged with  
#ROS on 12/12/2022



#ROS

# 1,040

Number of Github  
repositories tagged with  
#ROS2 on 12/12/2022



ROS