**OPEN SOURCE SOFTWARE NOTICE**

The open source software notice for the open source software used in this openEuler distribution (“openEuler distribution”) is provided in this document. The open source software licenses are granted by the respective right holders. With regard to the respective open source software contained in the openEuler distribution, the applicable open source software license will prevail all other license agreement, including but not limited to the openEuler Software License, in case of any conflicts.

**Warranty Disclaimer**

**THE OPEN SOURCE SOFTWARE IN THIS OPENEULER DISTRIBUTION IS PROVIDED ON AN "AS IS" BASIS, WITHOUT ANY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.  
See the applicable licenses for more details.**

**Copyright Notice and License Texts**

Software: samtools 1.17

**Copyright notice:**

Copyright (C) 2017, 2019-2020 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2015 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2013, 2016, 2018-2020, 2022 Genome Research Ltd.  
Copyright (C) 2014-2019 Genome Research Ltd.  
Copyright (c) 2011 Heng Li <lh3@live.co.uk>  
Copyright (c) 2013-2020 Genome Research Ltd.  
Copyright (C) 2013-2016,2018-2019 Genome Research Ltd.  
Copyright (C) 2012-2015, 2021-2022 Genome Research Ltd.  
Copyright (C) 2019-2020 Genome Research Ltd.  
Copyright (C) 2012, 2013 Broad Institute.  
Copyright (C) 2023 Genome Research Ltd., samtoolsversion(), htsversion());  
Copyright (C) 2010, 2013-2019, 2021-2022 Genome Research Ltd.  
Copyright (C) 2012-2017, 2019-2021 Genome Research Ltd.  
Copyright (C) 2012-2020, 2022 Genome Research Ltd.  
Copyright (c) 2008, 2012-2013, 2017-2019 Genome Research Ltd (GRL).  
Copyright (C) 2009-2011 Broad Institute.  
Copyright (C) 2013, 2014-2015 Genome Research Ltd.  
Portions copyright (C) 2009-2011 Broad Institute.  
Copyright (C) 2009-2017, 2019-2020 Genome Research Ltd.  
Copyright (c) 2019-2021 Genome Research Ltd.  
Copyright (C) 2008-2010, 2013 Genome Research Ltd.  
Copyright (C) 2009, 2015, 2016, 2019 Genome Research Ltd.  
Copyright (C) 2010, 2011 Broad Institute.  
Copyright (c) 2013, 2015-2017, 2019-2021 Genome Research Limited.  
Copyright (C) 2015, 2016, 2018-2020, 2022-2023 Genome Research Ltd.  
Copyright (C) 2011, 2012 Broad Institute.  
Copyright (C) 2012-2014, 2019, 2021 Genome Research Ltd.  
Copyright (c) 2011-2013, 2018-2022 Genome Research Ltd.  
Portions copyright (C) 2019-2021 Genome Research Ltd.  
Copyright (c) 2005-2006, 2008-2009, 2013, 2015, 2017-2019 Genome Research Ltd.  
Copyright (C) 2013-2021 Genome Research Ltd.  
Copyright (C) 2008-2014, 2019 Genome Research Ltd.  
Copyright (c) 2016-2020 Genome Research Ltd.  
Copyright (C) 2015-2017 Genome Research Ltd.  
Copyright (C) 2008, 2013, 2021 Genome Research Ltd.  
Copyright (C) 2012-2022 Genome Research Ltd.  
Copyright (C) 2014, 2017-2019 Genome Research Ltd.  
Copyright (c) 2008, 2009, 2011 Attractive Chaos <attractor@live.co.uk>  
Portions copyright (C) 2012 Peter Cock, The James Hutton Institute.  
Copyright (C) 2008-2010, 2013, 2015, 2019 Genome Research Ltd.  
Copyright (C) 2012-2018, 2020-2022 Genome Research Ltd.  
Copyright (c) 2009, 2013, 2018 Genome Research Ltd.  
Copyright (c) 2012-2020, 2022-2023 Genome Research Ltd.  
Copyright (C) 2012, 2013, 2016-2017, 2019 Genome Research Ltd.  
Copyright (C) 2014,2016,2018, 2020 Genome Research Ltd.  
Copyright (C) 2013-2016, 2019 Genome Research Ltd.  
Copyright (C) 2010, 2012 Broad Institute.  
Copyright (C) 2008, 2009, 2013-2020, 2022 Genome Research Ltd.  
Copyright (C) 2017-2023 Genome Research Ltd.  
Copyright (C) 2014-2016, 2018, 2019 Genome Research Ltd.  
Copyright (c) 2012-2013, 2015, 2018 Genome Research Ltd.  
Copyright (C) 2012-2021 Genome Research Ltd.  
Portions copyright (C) 2009 Broad Institute.  
Copyright (C) 2012-2019 Genome Research Ltd.  
Copyright (C) 2014, 2016 Genome Research Ltd.  
Portions copyright (C) 2014 Intel Corporation.  
Copyright (C) 2013-2014,2020 Genome Research Ltd.  
Copyright (c) 2014 Genome Research Ltd.  
copyright (C) 2003-2006, 2008-2010 by Heng Li <lh3@live.co.uk>  
Copyright (c) 2019,2020 Genome Research Ltd.  
Copyright (C) 2010, 2012, 2013 Broad Institute.  
Copyright (C) 2009, 2012 University of California - Los Angeles.  
Copyright (c) 2013-2017, 2019, 2020 Genome Research Ltd.  
Copyright (c) 2019-2022 Genome Research Ltd.  
Copyright (C) 2012-2013, 2015, 2016, 2019 Genome Research Ltd.  
Copyright (C) 2011 Broad Institute.  
Copyright (C) 2017, 2020 Genome Research Ltd.  
Copyright (c) 2008, 2009, 2013, 2018 Genome Research Ltd.  
Copyright (c) 2021 Genome Research Ltd.  
Copyright (C) 2020-2022 Genome Research Ltd.  
Copyright (c) 2012-2020, 2022 Genome Research Ltd.  
Copyright (c) 2015, 2018-2020, 2022-2023 Genome Research Ltd.  
Copyright (C) 2011 by Attractive Chaos <attractor@live.co.uk>  
Copyright (C) 2015-2017, 2019-2020 Genome Research Ltd.  
Copyright (c) 2003-2013, 2018-2019 Genome Research Ltd.  
Copyright (c) 2008, 2018 Genome Research Ltd (GRL).  
Copyright (C) 2015-2016, 2018-2020 Genome Research Ltd.  
Copyright (c) 2001 Alexander Peslyak and it is hereby released to the general public under the following terms:  
Copyright (C) 2013-2015,2017, 2019-2020 Genome Research Ltd.  
Copyright (c) 2022 Genome Research Ltd.  
Copyright (C) 2015, 2019 Genome Research Ltd.  
Copyright (c) 2009, 2013, 2015, 2018-2019 Genome Research Ltd.  
Copyright (c) 2005-2006, 2008-2009, 2013, 2018 Genome Research Ltd.  
Copyright (c) 2009,2018 The Broad Institute. MIT license.  
Copyright (c) 2012-2013, 2018 Genome Research Ltd.  
Copyright (C) 2009, 2010, 2012-2015, 2017-2020, 2022 Genome Research Ltd.  
Copyright (C) 2023 Genome Research Ltd.  
Copyright (c) 2011-2013, 2018-2019 Genome Research Ltd.  
Copyright (C) 2008-2013, 2015, 2019-2020, 2022 Genome Research Ltd.  
Copyright (C) 2014-2015, 2018 Genome Research Ltd.  
Copyright (C) 2013, 2018, 2020 Genome Research Ltd.  
Copyright (C) 2022 Genome Research Ltd.  
Copyright (C) 2012-2023 Genome Research Ltd.  
Copyright (C) 2021 Pierre Lindenbaum Institut du Thorax. u1087 Nantes. France.  
Copyright (C) 2009, 2013-2021 Genome Research Ltd  
Copyright (C) 2014-2016, 2019-2020 Genome Research Ltd.  
Copyright (C) 2017, 2018 Genome Research Ltd.  
Copyright (c) 1993, 1995-2002 MEDICAL RESEARCH COUNCIL All rights reserved  
Copyright (C) 2015, 2018 Genome Research Ltd.  
Copyright (C) 2012-2016, 2018, 2019-2022 Genome Research Ltd.  
Copyright (c) 2012, 2018-2019 Genome Research Ltd.  
Copyright (c) 2011-2016, Yann Collet All rights reserved.  
Copyright (C) 2012 Broad Institute.  
Copyright (C) 2008-2015, 2019, 2021 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2012-2023 Genome Research Ltd.  
Copyright (C) 2020 University of Glasgow.  
Copyright (c) 2008, 2009, 2011 by Attractive Chaos <attractor@live.co.uk>  
Copyright (c) 2017, 2019 Genome Research Ltd.  
Copyright (C) 2016-2017, 2020 Genome Research Ltd.  
Copyright (C) 2014-2020, 2022 Genome Research Ltd.  
Copyright (c) 2021 Genome Research Ltd (GRL).  
Copyright (C) 2010-2012 Broad Institute.  
Copyright (C) 2010-2012, 2014-2020 Genome Research Ltd.  
Copyright (C) 2013-2014, 2016, 2018 Genome Research Ltd.  
Copyright (C) 2016,2018-2020 Genome Research Ltd.  
Copyright (C) 2008-2010, 2012-2023 Genome Research Ltd.  
Copyright (C) 1998-2001,2003 Medical Research Council (Gap4/5 source)  
Copyright (C) 2008, 2009, 2013, 2014, 2016, 2017-2020, 2022 Genome Research Ltd.  
Copyright (C) 2017-2018 Genome Research Ltd.  
Copyright (C) 2008, 2013 Genome Research Ltd.  
Copyright (C) 2008-2015, 2019-2021 Genome Research Ltd.  
Copyright (c) 2020 Genome Research Ltd.  
Copyright (C) 2013-2015, 2019 Genome Research Ltd.  
Copyright (C) 2020-2021 Genome Research Ltd.  
Copyright (C) 2008-2016, 2019-2020 Genome Research Ltd.  
Copyright (C) 2018-2019 Genome Research Ltd.  
Copyright (C) 2014, 2018 Genome Research Ltd.  
Copyright (C) 2011 Attractive Chaos <attractor@live.co.uk>  
Copyright (C) 2023 Genome Research Ltd., htsversion());  
Copyright (C) 2012, 2013, 2015-2016 Genome Research Ltd.  
Copyright (C) 2015-2016, 2020 Genome Research Ltd.  
Copyright (C) 2013-2014 Genome Research Ltd.  
Copyright (C) 2014, 2019 Genome Research Ltd.  
Copyright (c) 2019-2020, 2022 Genome Research Ltd.  
Copyright (C) 2003-2005,2007-2023 Genome Research Ltd.  
Copyright (C) 2008-2011, 2013-2016, 2018, 2019 Genome Research Ltd.  
Copyright (c) 2008-2009, by Attractive Chaos <attractor@live.co.uk>  
Copyright (C) 2013-2014, 2018-2022 Genome Research Ltd.  
Copyright (c) 1993 Martin Birgmeier All rights reserved.  
Copyright (C) 2013-2020 Genome Research Ltd.  
Copyright (C) 2003-2006, 2008-2010 by Heng Li <lh3lh3@live.co.uk>  
Copyright (C) 2013 Genome Research Ltd.  
Copyright (C) 2010, 2013-2014, 2020 Genome Research Ltd.  
Copyright (C) 2020 Genome Research Ltd.  
Copyright (c) 2012-2014, 2016, 2018, 2020 Genome Research Ltd.  
Copyright (C) 2017, 2019 Genome Research Ltd.  
Copyright (c) 2008 Broad Institute / Massachusetts Institute of Technology 2011, 2012 Attractive Chaos <attractor@live.co.uk>  
Copyright (C) 2009, 2011-2017, 2019, 2022 Genome Research Ltd.  
Copyright (C) 2013, 2015-2019,2023 Genome Research Ltd.  
Copyright (C) 2009, 2013, 2014, 2017, 2018-2019, 2022 Genome Research Ltd  
Portions copyright (C) 2011 Broad Institute.  
Copyright (C) 2016, 2018-2020 Genome Research Ltd.  
Copyright (C) 2014,2018-2019 Genome Research Ltd.  
Copyright (C) 2015-2017, 2019-2022 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2013 Genome Research Ltd.  
Copyright (c) 2012-2015, 2018, 2020, 2023 Genome Research Ltd.  
Portions copyright (C) 2013 Peter Cock, The James Hutton Institute.  
Copyright (C) 2014-2016, 2018, 2019, 2023 Genome Research Ltd.  
Copyright (C) 2018,2019 Florian Breitwieser  
Copyright (C) 2010 Broad Institute.  
Copyright (C) 2019 Genome Research Ltd.  
Copyright (c) 2010-2013, 2018, 2020 Genome Research Ltd.  
Copyright (C) 2016-2017 Genome Research Ltd.  
Copyright (c) 2013-2019 Genome Research Ltd.  
Portions copyright (C) 2009-2012 Broad Institute.  
Copyright (C) 2008-2009, 2011-2013, 2015-2017, 2019, 2021 Genome Research Ltd.  
Copyright (c) 2010, 2013, 2018-2019 Genome Research Ltd.  
Copyright (c) 2019 Genome Research Ltd.  
Copyright (C) 2013, 2014 Genome Research Ltd.  
Copyright (c) 2012-2020 Genome Research Ltd.  
Copyright (c) 2012-2016, 2018-2020 Genome Research Ltd.  
Copyright (C) 2009, 2012-2015, 2019 Genome Research Ltd.  
Copyright (C) 2009-2011, 2014-2016, 2018, 2021 Genome Research Ltd.  
Copyright (C) 2013-2014, 2016, 2018-2020, 2022 Genome Research Ltd.  
Copyright (C) 2018 Google LLC.  
Copyright (C) 2018, 2020 Genome Research Ltd.  
Copyright (c) 2017-2023 Genome Research Ltd.  
Copyright (C) 2022, 2023 Genome Research Ltd.  
Copyright (C) 2014-2015, 2020 Genome Research Ltd.  
Copyright (c) 2004, 2006, 2009-2011, 2013, 2017-2018 Genome Research Ltd.  
Copyright (C) 2013-2014, 2021 Genome Research Ltd.  
Copyright (C) 2009-2011, 2014-2015, 2019-2020, 2022 Genome Research Ltd.  
Copyright (c) 2009-2010, 2013 Genome Research Ltd.  
Copyright (C) 2013, 2015 Genome Research Ltd.  
Copyright (c) 2017-2022 Genome Research Ltd.  
Copyright (C) 2008, 2013, 2019 Genome Research Ltd.  
Copyright (c) 2008, 2012, 2014, 2021-2022 Genome Research Ltd (GRL).  
Copyright (c) 2010, 2013, 2018 Genome Research Ltd.  
Copyright (C) 2013-2014, 2019 Genome Research Ltd.  
Copyright (C) 2017-2018, 2021 Genome Research Ltd.  
Copyright (c) 2014-2019 Genome Research Ltd.  
Copyright (C) 2014, 2016, 2019 Genome Research Ltd.  
Copyright (C) 2017 Genome Research Ltd.  
Portions copyright (C) 2012, 2013 Peter Cock, The James Hutton Institute.  
Portions copyright (C) 2010 Broad Institute.  
Copyright (c) 2012-2021,2023 Genome Research Ltd.  
Copyright (C) 2011-2017, Yann Collet.  
Copyright (C) 2017-2021 Genome Research Ltd.  
Copyright (C) 2008-2023 Genome Research Ltd.  
Copyright (C) 2013-2016, 2020-2021 Genome Research Ltd.  
Copyright (c) 2016-2022 Genome Research Ltd.  
Copyright (C) 2014 Genome Research Ltd.  
Copyright (c) 1994-1997, 2001-2002 MEDICAL RESEARCH COUNCIL All rights reserved  
Copyright (c) 2013, 2018 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2018 Genome Research Ltd.  
Copyright (c) 2021-2023 Genome Research Ltd.  
Copyright (C) 2013, 2014, 2017-2021 Genome Research Ltd.  
Copyright (C) 2010, 2013-2014 Genome Research Ltd.  
Copyright (C) 2016, 2021 Genome Research Ltd.  
Copyright (C) 2020, 2022 Genome Research Ltd.  
Copyright (c) 2013-2016 Genome Research Ltd.  
Copyright (C) 2013-2015, 2019, 2023 Genome Research Ltd.  
Copyright (c) 2008, 2009, 2013, 2014-2015, 2018-2020 Genome Research Ltd.  
Copyright (C) 2009-2023 Genome Research Ltd.  
Copyright (C) 2008, 2009, 2013-2022 Genome Research Ltd.  
Copyright (C) 2013-2018, 2020-2021 Genome Research Ltd.  
Copyright (C) 2013-2022 Genome Research Ltd.  
Copyright (c) 2017-2019 Genome Research Ltd.  
Copyright (C) 2009, 2011, 2013-2015, 2019, 2021 Genome Research Ltd.  
Copyright (C) 2013 Pierre Lindenbaum, Institut du Thorax, INSERM U1087, Université de Nantes.  
Copyright (c) 2012-2023 Genome Research Ltd.  
Copyright (c) 2018-2020 Genome Research Ltd.  
Copyright (C) 2015, 2020 Genome Research Ltd.  
2011 Heng Li <lh3@live.co.uk>  
Copyright (C) 2008, 2009 Broad Institute / Massachusetts Institute of Technology  
Copyright (c) 2014-2022 Genome Research Ltd.  
Copyright (C) 2008-2022 Genome Research Ltd.  
Copyright (C) 2018 Genome Research Ltd.  
Copyright (C) 2014-2015 Genome Research Ltd.  
Copyright (c) 2000-2001 MEDICAL RESEARCH COUNCIL All rights reserved  
Copyright (c) 2003 MEDICAL RESEARCH COUNCIL All rights reserved  
Copyright (C) 2017, 2019 Genome Research Ltd

**License:** MIT and BSD

MIT License  
  
Copyright (c) <year> <copyright holders>  
  
Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:  
  
The above copyright notice and this permission notice (including the next paragraph) shall be included in all copies or substantial portions of the Software.  
  
THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.  
  
BSD Zero Clause License  
Copyright (C) 2006 by Rob Landley <rob@landley.net>  
  
Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted.  
  
THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.