

BIG-IP[®] Systems: Upgrading Active-Standby Systems

Version 11.6



Table of Contents

Legal Notices.....	5
Acknowledgments.....	7
Chapter 1: Upgrading Version 10.x BIG-IP Active-Standby Systems.....	19
Overview: Upgrading BIG-IP active-standby systems.....	19
DSC components.....	22
About traffic groups.....	23
Task summary.....	23
Preparing BIG-IP modules for an upgrade from version 10.x to the new version software.....	23
Preparing BIG-IP active-standby systems for an upgrade.....	28
Upgrading the standby BIG-IP 2 system.....	29
Upgrading the active BIG-IP 1 system.....	31
Verifying a BIG-IP active-standby upgrade.....	32
Implementation result.....	33

Legal Notices

Publication Date

This document was published on September 25, 2015.

Publication Number

MAN-0374-06

Copyright

Copyright © 2014-2015, F5 Networks, Inc. All rights reserved.

F5 Networks, Inc. (F5) believes the information it furnishes to be accurate and reliable. However, F5 assumes no responsibility for the use of this information, nor any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent, copyright, or other intellectual property right of F5 except as specifically described by applicable user licenses. F5 reserves the right to change specifications at any time without notice.

Trademarks

AAM, Access Policy Manager, Advanced Client Authentication, Advanced Firewall Manager, Advanced Routing, AFM, Application Acceleration Manager, Application Security Manager, APM, ARX, AskF5, ASM, BIG-IP, BIG-IQ, Cloud Extender, CloudFucious, Cloud Manager, Clustered Multiprocessing, CMP, COHESION, Data Manager, DevCentral, DevCentral [DESIGN], DNS Express, DSC, DSI, Edge Client, Edge Gateway, Edge Portal, ELEVATE, EM, Enterprise Manager, ENGAGE, F5, F5 [DESIGN], F5 Certified [DESIGN], F5 Networks, F5 SalesXchange [DESIGN], F5 Synthesis, f5 Synthesis, F5 Synthesis [DESIGN], F5 TechXchange [DESIGN], Fast Application Proxy, Fast Cache, FirePass, Global Traffic Manager, GTM, GUARDIAN, iApps, IBR, iCall, Intelligent Browser Referencing, Intelligent Compression, IPv6 Gateway, iControl, iHealth, iQuery, iRules, iRules OnDemand, iSession, L7 Rate Shaping, LC, Link Controller, LineRate, LineRate Systems [DESIGN], Local Traffic Manager, LROS, LTM, Message Security Manager, MobileSafe, MSM, OneConnect, Packet Velocity, PEM, Policy Enforcement Manager, Protocol Security Manager, PSM, Real Traffic Policy Builder, SalesXchange, ScaleN, SDAC (except in Japan), SDC, Signalling Delivery Controller, Solutions for an application world, Software Designed Applications Services, SSL Acceleration, StrongBox, SuperVIP, SYN Check, TCP Express, TDR, TechXchange, TMOS, TotALL, Traffic Management Operating System, Traffix (except Germany), Traffix [DESIGN] (except Germany), Transparent Data Reduction, UNITY, VAULT, vCMP, VE F5 [DESIGN], Versafe, Versafe [DESIGN], VIPRION, Virtual Clustered Multiprocessing, WebSafe, and ZoneRunner, are trademarks or service marks of F5 Networks, Inc., in the U.S. and other countries, and may not be used without F5's express written consent.

All other product and company names herein may be trademarks of their respective owners.

Patents

This product may be protected by one or more patents indicated at:
<http://www.f5.com/about/guidelines-policies/patents>

Export Regulation Notice

This product may include cryptographic software. Under the Export Administration Act, the United States government may consider it a criminal offense to export this product from the United States.

RF Interference Warning

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This unit generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Any modifications to this device, unless expressly approved by the manufacturer, can void the user's authority to operate this equipment under part 15 of the FCC rules.

Canadian Regulatory Compliance

This Class A digital apparatus complies with Canadian ICES-003.

Standards Compliance

This product conforms to the IEC, European Union, ANSI/UL and Canadian CSA standards applicable to Information Technology products at the time of manufacture.

Acknowledgments

This product includes software developed by Bill Paul.

This product includes software developed by Jonathan Stone.

This product includes software developed by Manuel Bouyer.

This product includes software developed by Paul Richards.

This product includes software developed by the NetBSD Foundation, Inc. and its contributors.

This product includes software developed by the Politecnico di Torino, and its contributors.

This product includes software developed by the Swedish Institute of Computer Science and its contributors.

This product includes software developed by the University of California, Berkeley and its contributors.

This product includes software developed by the Computer Systems Engineering Group at the Lawrence Berkeley Laboratory.

This product includes software developed by Christopher G. Demetriou for the NetBSD Project.

This product includes software developed by Adam Glass.

This product includes software developed by Christian E. Hopps.

This product includes software developed by Dean Huxley.

This product includes software developed by John Kohl.

This product includes software developed by Paul Kranenburg.

This product includes software developed by Terrence R. Lambert.

This product includes software developed by Philip A. Nelson.

This product includes software developed by Herb Peyerl.

This product includes software developed by Jochen Pohl for the NetBSD Project.

This product includes software developed by Chris Provenzano.

This product includes software developed by Theo de Raadt.

This product includes software developed by David Muir Sharnoff.

This product includes software developed by SigmaSoft, Th. Lockert.

This product includes software developed for the NetBSD Project by Jason R. Thorpe.

This product includes software developed by Jason R. Thorpe for And Communications, <http://www.and.com>.

This product includes software developed for the NetBSD Project by Frank Van der Linden.

This product includes software developed for the NetBSD Project by John M. Vinopal.

This product includes software developed by Christos Zoulas.

This product includes software developed by the University of Vermont and State Agricultural College and Garrett A. Wollman.

This product includes software developed by Balazs Scheidler (bazsi@balabit.hu), which is protected under the GNU Public License.

This product includes software developed by Niels Mueller (nisse@lysator.liu.se), which is protected under the GNU Public License.

Acknowledgments

In the following statement, "This software" refers to the Mitsumi CD-ROM driver: This software was developed by Holger Veit and Brian Moore for use with 386BSD and similar operating systems. "Similar operating systems" includes mainly non-profit oriented systems for research and education, including but not restricted to NetBSD, FreeBSD, Mach (by CMU).

This product includes software developed by the Apache Group for use in the Apache HTTP server project (<http://www.apache.org/>).

This product includes software licensed from Richard H. Porter under the GNU Library General Public License (© 1998, Red Hat Software), www.gnu.org/copyleft/lgpl.html.

This product includes the standard version of Perl software licensed under the Perl Artistic License (© 1997, 1998 Tom Christiansen and Nathan Torkington). All rights reserved. You may find the most current standard version of Perl at <http://www.perl.com>.

This product includes software developed by Jared Minch.

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>).

This product includes cryptographic software written by Eric Young (ey@cryptsoft.com).

This product contains software based on oprofile, which is protected under the GNU Public License.

This product includes software with glib library utility functions, which is protected under the GNU Public License.

This product includes software with grub2 bootloader functions, which is protected under the GNU Public License.

This product includes software with the Intel Gigabit Linux driver, which is protected under the GNU Public License. Copyright ©1999 - 2012 Intel Corporation.

This product includes software with the Intel 10 Gigabit PCI Express Linux driver, which is protected under the GNU Public License. Copyright ©1999 - 2012 Intel Corporation.

This product includes RRDtool software developed by Tobi Oetiker (<http://www.rrdtool.com/index.html>) and licensed under the GNU General Public License.

This product contains software licensed from Dr. Brian Gladman under the GNU General Public License (GPL).

This product includes software developed by the Apache Software Foundation (<http://www.apache.org/>).

This product includes Hypersonic SQL.

This product contains software developed by the Regents of the University of California, Sun Microsystems, Inc., Scriptics Corporation, and others.

This product includes software developed by the Internet Software Consortium.

This product includes software developed by Nominum, Inc. (<http://www.nominum.com>).

This product contains software developed by Broadcom Corporation, which is protected under the GNU Public License.

This product contains software developed by MaxMind LLC, and is protected under the GNU Lesser General Public License, as published by the Free Software Foundation.

This product includes software developed by Andrew Tridgell, which is protected under the GNU Public License, copyright ©1992-2000.

This product includes software developed by Jeremy Allison, which is protected under the GNU Public License, copyright ©1998.

This product includes software developed by Guenther Deschner, which is protected under the GNU Public License, copyright ©2008.

This product includes software developed by www.samba.org, which is protected under the GNU Public License, copyright ©2007.

This product includes software from Allan Jardine, distributed under the MIT License.

This product includes software from Trent Richardson, distributed under the MIT License.

This product includes vmbus drivers distributed by Microsoft Corporation.

This product includes software from Cavium.

This product includes software from Webroot, Inc.

This product includes software from Maxmind, Inc.

This product includes software from OpenVision Technologies, Inc. Copyright ©1993-1996, OpenVision Technologies, Inc. All Rights Reserved.

This product includes software developed by Matt Johnson, distributed under the MIT License. Copyright ©2012.

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 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.

This product includes software from NLnetLabs. Copyright ©2001-2006. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of NLnetLabs nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes GRand Unified Bootloader (GRUB) software developed under the GNU Public License, copyright ©2007.

Acknowledgments

This product includes Intel QuickAssist kernel module, library, and headers software licensed under the GNU General Public License (GPL).

This product includes gd-libgd library software developed by the following in accordance with the following copyrights:

- Portions copyright ©1994, 1995, 1996, 1997, 1998, 2000, 2001, 2002 by Cold Spring Harbor Laboratory. Funded under Grant P41-RR02188 by the National Institutes of Health.
- Portions copyright ©1996, 1997, 1998, 1999, 2000, 2001, 2002 by Boutell.Com, Inc.
- Portions relating to GD2 format copyright ©1999, 2000, 2001, 2002 Philip Warner.
- Portions relating to PNG copyright ©1999, 2000, 2001, 2002 Greg Roelofs.
- Portions relating to gdtf.c copyright ©1999, 2000, 2001, 2002 John Ellson (ellson@lucent.com).
- Portions relating to gdtf.c copyright ©2001, 2002 John Ellson (ellson@lucent.com).
- Portions copyright ©2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007 2008 Pierre-Alain Joye (pierre@libgd.org).
- Portions relating to JPEG and to color quantization copyright ©2000, 2001, 2002, Doug Becker and copyright ©1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, Thomas G. Lane. This software is based in part on the work of the Independent JPEG Group.
- Portions relating to WBMP copyright 2000, 2001, 2002 Maurice Szmurlo and Johan Van den Brande. Permission has been granted to copy, distribute and modify gd in any context without fee, including a commercial application, provided that this notice is present in user-accessible supporting documentation.

This product includes software developed by Oracle America, Inc. Copyright ©2012.

1. Java Technology Restrictions. Licensee shall not create, modify, change the behavior of, or authorize licensees of licensee to create, modify, or change the behavior of, classes, interfaces, or subpackages that are in any way identified as "java", "javax", "sun" or similar convention as specified by Oracle in any naming convention designation. In the event that Licensee creates an additional API(s) which: (a) extends the functionality of a Java Environment; and (b) is exposed to third party software developers for the purpose of developing additional software which invokes such additional API, Licensee must promptly publish broadly an accurate specification for such API for free use by all developer.
2. Trademarks and Logos. This License does not authorize an end user licensee to use any Oracle America, Inc. name, trademark, service mark, logo or icon. The end user licensee acknowledges that Oracle owns the Java trademark and all Java-related trademarks, logos and icon including the Coffee Cup and Duke ("Java Marks") and agrees to: (a) comply with the Java Trademark Guidelines at <http://www.oracle.com/html/3party.html>; (b) not do anything harmful to or inconsistent with Oracle's rights in the Java Marks; and (c) assist Oracle in protecting those rights, including assigning to Oracle any rights acquired by Licensee in any Java Mark.
3. Source Code. Software may contain source code that, unless expressly licensed for other purposes, is provided solely for reference purposes pursuant to the terms of your license. Source code may not be redistributed unless expressly provided for in the terms of your license.
4. Third Party Code. Additional copyright notices and license terms applicable to portion of the Software are set forth in the THIRDPARTYLICENSEREADME.txt file.
5. Commercial Features. Use of the Commercial Features for any commercial or production purpose requires a separate license from Oracle. "Commercial Features" means those features identified in Table I-I (Commercial Features In Java SE Product Editions) of the Software documentation accessible at <http://www.oracle.com/technetwork/java/javase/documentation/index.html>.

This product includes utilities developed by Linus Torvalds for inspecting devices connected to a USB bus.

This product includes perl-PHP-Serialization software, developed by Jesse Brown, copyright ©2003, and distributed under the Perl Development Artistic License (<http://dev.perl.org/licenses/artistic.html>).

This product includes software developed by members of the CentOS Project under the GNU Public License, copyright ©2004-2011 by the CentOS Project.

This product includes software licensed from Gerald Combs (gerald@wireshark.org) under the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or any later version. Copyright ©1998 Gerald Combs.

This product includes software licensed from Rémi Denis-Courmont under the GNU Library General Public License. Copyright ©2006 - 2011.

This product includes software developed by jQuery Foundation and other contributors, distributed under the MIT License. Copyright ©2014 jQuery Foundation and other contributors (<http://jquery.com/>).

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 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.

This product includes software developed by Trent Richardson, distributed under the MIT License. Copyright ©2012 jQuery Foundation and other contributors (<http://jquery.com/>).

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 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.

This product includes software developed by Allan Jardine, distributed under the MIT License. Copyright ©2008 - 2012, Allan Jardine, all rights reserved, jQuery Foundation and other contributors (<http://jquery.com/>).

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 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.

This product includes software developed by Douglas Gilbert. Copyright ©1992 - 2012 The FreeBSD Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE FREEBSD PROJECT "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE FREEBSD PROJECT OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The views and conclusions contained in the software and documentation are those of the authors and should not be interpreted as representing official policies, either expressed or implied, of the FreeBSD Project.

This product includes software developed as open source software. Copyright ©1994 - 2012 The FreeBSD Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The names of the authors may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). Copyright ©1998 - 2011 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"

4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes software licensed from William Ferrell, Selene Scriven and many other contributors under the GNU General Public License, copyright ©1998 - 2006.

This product includes software developed by Thomas Williams and Colin Kelley. Copyright ©1986 - 1993, 1998, 2004, 2007

Permission to use, copy, and distribute this software and its documentation for any purpose with or without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Permission to modify the software is granted, but not the right to distribute the complete modified source code. Modifications are to be distributed as patches to the released version. Permission to distribute binaries produced by compiling modified sources is granted, provided you

1. distribute the corresponding source modifications from the released version in the form of a patch file along with the binaries,
2. add special version identification to distinguish your version in addition to the base release version number,
3. provide your name and address as the primary contact for the support of your modified version, and
4. retain our contact information in regard to use of the base software.

Permission to distribute the released version of the source code along with corresponding source modifications in the form of a patch file is granted with same provisions 2 through 4 for binary distributions. This software is provided "as is" without express or implied warranty to the extent permitted by applicable law.

This product includes software developed by the Computer Systems Engineering Group at Lawrence Berkeley Laboratory. Copyright ©1990-1994 Regents of the University of California. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: This product includes software developed by the Computer Systems Engineering Group at Lawrence Berkeley Laboratory.

Acknowledgments

4. Neither the name of the University nor of the Laboratory may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes software developed by Sony Computer Science Laboratories Inc. Copyright © 1997-2003 Sony Computer Science Laboratories Inc. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY SONY CSL AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL SONY CSL OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product contains software developed by Google, Inc. Copyright ©2011 Google, Inc.

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 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.

This product includes software developed by Jeremy Ashkenas and DocumentCloud, and distributed under the MIT license. Copyright © 2010-2013 Jeremy Ashkenas, DocumentCloud.

This product includes gson software, distributed under the Apache License version 2.0. Copyright © 2008-2011 Google Inc.

This product includes the ixgbevf Intel Gigabit Linux driver, Copyright © 1999 - 2012 Intel Corporation, and distributed under the GPLv2 license, as published by the Free Software Foundation.

This product includes libwebp software. Copyright © 2010, Google Inc. All rights reserved.

This product includes Angular software developed by Google, Inc., <http://angularjs.org>, copyright © 2010-2012 Google, Inc., and distributed under the MIT license.

This product includes node.js software, copyright © Joyent, Inc. and other Node contributors. All rights reserved.

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 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.

This product includes bootstrap software, copyright © 2011-2014 Twitter, Inc., and distributed under the MIT license (<http://getbootstrap.com/getting-started/#license-faqs>).

This product includes Intel PCM software, copyright © 2009-2013, Intel Corporation All rights reserved. This software is distributed under the OSI BSD license.

This product includes jxrlib software, copyright ©2009 Microsoft Corp. All rights reserved. Distributed under the new BSD license.

This product includes Net-SNMP software, to which one or more of the following copyrights apply:

- Copyright © 1989, 1991, 1992 by Carnegie Mellon University; Derivative Work - 1996, 1998-2000, Copyright © 1996, 1998-2000, The Regents of the University of California. All rights reserved. Distributed under CMU/UCD license (BSD like).
- Copyright © 2001-2003, Networks Associates Technology, Inc. All rights reserved. Distributed under the BSD license.
- Portions of this code are copyright © 2001-2003, Cambridge Broadband Ltd. All rights reserved. Distributed under the BSD license.
- Copyright © 2003 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved. Distributed under the BSD license.
- Copyright © 2003-2009, Sparta, Inc. All rights reserved. Distributed under the BSD license.
- Copyright © 2004, Cisco, Inc and Information Network Center of Beijing University of Posts and Telecommunications. All rights reserved. Distributed under the BSD license.
- Copyright © 2003 Fabasoft R&D Software GmbH & Co KG, oss@fabasoft.com. Distributed under the BSD license.
- Copyright © 2007 Apple Inc. All rights reserved. Distributed under the BSD license.
- Copyright © 2009 ScienceLogic, Inc. All rights reserved. Distributed under the BSD license.

This product includes Racoon 2 software, copyright © 2003-2005 WIDE Project. All rights reserved. Distributed under a BSD-like license.

This product includes node-uuid software, copyright © 2010-2012, Robert Kieffer, and distributed under the MIT license.

This product includes opensv software, which is distributed under the Apache 2.0 license.

Acknowledgments

This product includes owasp-jave-encoder software, copyright © 2014, Jeff Ichnowski, and distributed under the New BSD license.

This product may include Intel SDD software subject to the following license; check your hardware specification for details.

1. LICENSE. This Software is licensed for use only in conjunction with Intel solid state drive (SSD) products. Use of the Software in conjunction with non-Intel SSD products is not licensed hereunder. Subject to the terms of this Agreement, Intel grants to You a nonexclusive, nontransferable, worldwide, fully paid-up license under Intel's copyrights to:

- copy the Software onto a single computer or multiple computers for Your personal, noncommercial use; and
- make appropriate back-up copies of the Software, for use in accordance with Section 1a) above.

The Software may contain the software or other property of third party suppliers, some of which may be identified in, and licensed in accordance with, any enclosed "license.txt" file or other text or file.

Except as expressly stated in this Agreement, no license or right is granted to You directly or by implication, inducement, estoppel or otherwise. Intel will have the right to inspect or have an independent auditor inspect Your relevant records to verify Your compliance with the terms and conditions of this Agreement.

2. RESTRICTIONS. You will not:

- a. copy, modify, rent, sell, distribute or transfer any part of the Software, and You agree to prevent unauthorized copying of the Software; and,
- b. reverse engineer, decompile, or disassemble the Software; and,
- c. sublicense or permit simultaneous use of the Software by more than one user; and,
- d. otherwise assign, sublicense, lease, or in any other way transfer or disclose Software to any third party, except as set forth herein; and,
- e. subject the Software, in whole or in part, to any license obligations of Open Source Software including without limitation combining or distributing the Software with Open Source Software in a manner that subjects the Software or any portion of the Software provided by Intel hereunder to any license obligations of such Open Source Software. "Open Source Software" means any software that requires as a condition of use, modification and/or distribution of such software that such software or other software incorporated into, derived from or distributed with such software:
 - a. be disclosed or distributed in source code form; or
 - b. be licensed by the user to third parties for the purpose of making and/or distributing derivative works; or
 - c. be redistributable at no charge.

Open Source Software includes, without limitation, software licensed or distributed under any of the following licenses or distribution models, or licenses or distribution models substantially similar to any of the following:

- a. GNU's General Public License (GPL) or Lesser/Library GPL (LGPL),
- b. the Artistic License (e.g., PERL),
- c. the Mozilla Public License,
- d. the Netscape Public License,
- e. the Sun Community Source License (SCSL),
- f. vi) the Sun Industry Source License (SISL),
- g. vii) the Apache Software license, and
- h. viii) the Common Public License (CPL).

- 3. OWNERSHIP OF SOFTWARE AND COPYRIGHTS.** Title to all copies of the Software remains with Intel or its suppliers. The Software is copyrighted and protected by the laws of the United States and other countries, and international treaty provisions. You may not remove any copyright notices from the Software. Intel may make changes to the Software, or to materials referenced therein, at any time and without notice, but is not obligated to support or update the Software. Except as otherwise expressly provided, Intel grants no express or implied right or license under Intel patents, copyrights, trademarks, or other intellectual property rights.
- 4. Entire Agreement.** This Agreement contains the complete and exclusive statement of the agreement between You and Intel and supersedes all proposals, oral or written, and all other communications relating to the subject matter of this Agreement. Only a written instrument duly executed by authorized representatives of Intel and You may modify this Agreement.
- 5. LIMITED MEDIA WARRANTY.** If the Software has been delivered by Intel on physical media, Intel warrants the media to be free from material physical defects for a period of ninety (90) days after delivery by Intel. If such a defect is found, return the media to Intel for replacement or alternate delivery of the Software as Intel may select.
- 6. EXCLUSION OF OTHER WARRANTIES.** EXCEPT AS PROVIDED ABOVE, THE SOFTWARE IS PROVIDED "AS IS" WITHOUT ANY EXPRESS OR IMPLIED WARRANTY OF ANY KIND, INCLUDING WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE. Intel does not warrant or assume responsibility for any errors, the accuracy or completeness of any information, text, graphics, links or other materials contained within the Software.
- 7. LIMITATION OF LIABILITY.** IN NO EVENT WILL INTEL OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION OR LOST INFORMATION) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE, EVEN IF INTEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME JURISDICTIONS PROHIBIT EXCLUSION OR LIMITATION OF LIABILITY FOR IMPLIED WARRANTIES OR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. YOU MAY ALSO HAVE OTHER LEGAL RIGHTS THAT VARY FROM JURISDICTION TO JURISDICTION.
- 8. TERMINATION OF THIS AGREEMENT.** Intel may terminate this Agreement at any time if You violate its terms. Upon termination, You will immediately destroy the Software or return all copies of the Software to Intel.
- 9. APPLICABLE LAWS.** Claims arising under this Agreement will be governed by the laws of Delaware, excluding its principles of conflict of laws and the United Nations Convention on Contracts for the Sale of Goods. You may not export the Software in violation of applicable export laws and regulations. Intel is not obligated under any other agreements unless they are in writing and signed by an authorized representative of Intel.
- 10. GOVERNMENT RESTRICTED RIGHTS.** The Software is provided with "RESTRICTED RIGHTS." Use, duplication, or disclosure by the Government is subject to restrictions as set forth in FAR52.227-14 and DFAR252.227-7013 et seq. or their successors. Use of the Software by the Government constitutes acknowledgment of Intel's proprietary rights therein. Contractor or Manufacturer is Intel Corporation, 2200 Mission College Blvd., Santa Clara, CA 95054.

Chapter 1

Upgrading Version 10.x BIG-IP Active-Standby Systems

- *Overview: Upgrading BIG-IP active-standby systems*
- *Task summary*
- *Implementation result*

Overview: Upgrading BIG-IP active-standby systems

A BIG-IP[®] system active-standby pair for version 10.x includes one BIG-IP system operating in active mode (Device A) and one BIG-IP system operating in standby mode (Device B).

Important: *In order to upgrade version 10.0.0 or 10.0.1 to the new version software, you must first upgrade to version 10.1.0 or 10.2.x, and then upgrade version 10.1.0 or 10.2.x to the new version software.*

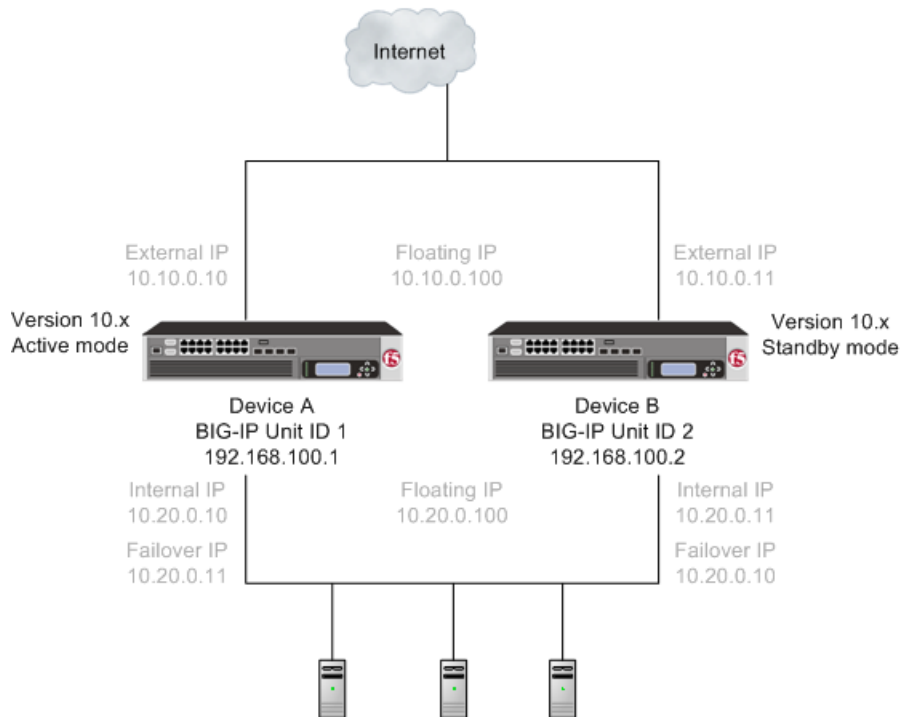


Figure 1: A version 10.x active-standby pair

After preparing the devices for an upgrade to the new version software, you force Device B to offline mode, and then install the new version software onto Device B (the offline device). When you finish the installation

of the new version software onto Device B, it creates a traffic group called `traffic-group-1`. The new version software traffic group is in standby state on Device B, and Device A (the version 10.x device) is in active mode. Note that the Unit ID that was used in version 10.x becomes obsolete in the new version software.

Important: Once Device B reboots, if the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device B before upgrading Device A, to ensure that traffic groups using the network HSM function properly.

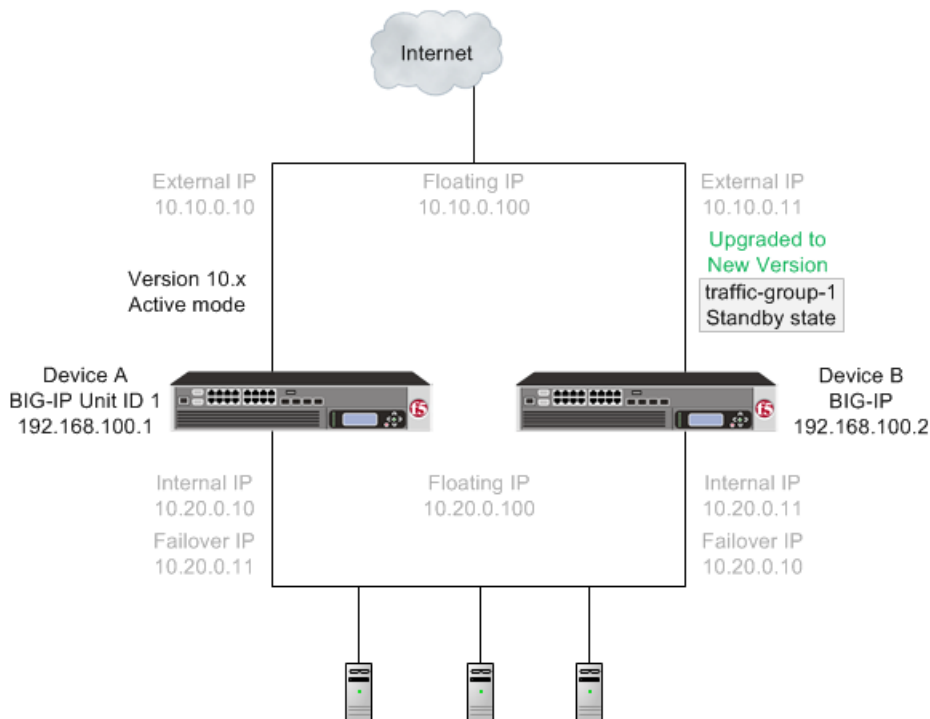


Figure 2: A version 10.x device in active mode and a new software version traffic group in standby state

With the new version software installed on Device B and `traffic-group-1` in standby state, you can force Device A to offline mode, changing Device B to active state so that it can pass traffic, and then install the new software version onto Device A. When installation of the new version software onto Device A completes, you can reboot Device A to the location of the new version software image.

Important: Once Device A reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device A to ensure that traffic groups using the network HSM function properly.

When you complete upgrading both devices to the new version software, the BIG-IP configuration includes a traffic group in active state on Device B, a traffic group in standby state on Device A, and a device group that includes both devices.

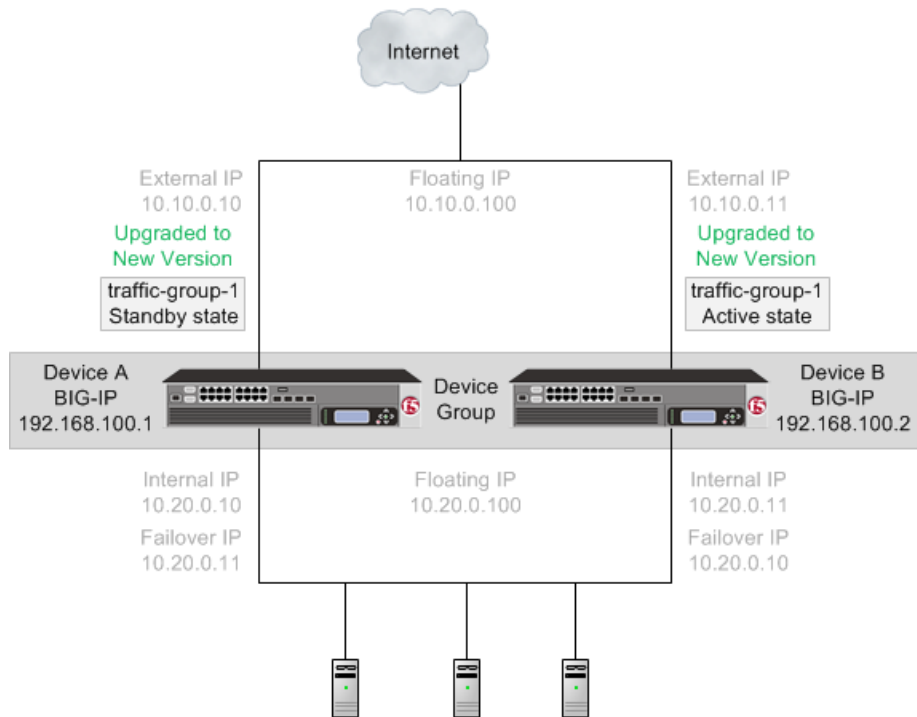


Figure 3: A new version software traffic group in active and standby states

An upgrade of BIG-IP active-standby systems to the new version software involves the following tasks.

Task	Description
Preparing Device A (the active mode BIG-IP 1 system) and Device B (the standby mode BIG-IP 2 system)	In preparing to upgrade the active-standby BIG-IP systems to the new version software, you need to understand any specific configuration or functional changes from the previous version, and prepare the systems. You also download the new version of software from the AskF5 web site (http://support.f5.com/kb/en-us.html) and import the files onto each device.
Forcing Device B to offline mode	When you complete preparation of Device B, you can force Device B to offline mode.
Upgrading Device B (the offline mode BIG-IP 2 system)	Once Device B is in offline mode, you can upgrade the software on that device, and then reboot Device B to the location of the new version software image. Device B completes rebooting with traffic-group-1 in standby state. Important: Once Device B reboots, if the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device B before upgrading Device A, to ensure that traffic groups using the network HSM function properly.
Forcing Device A to offline mode	When Device B completes rebooting to the location of the new version software image, you can force

Task	Description
Upgrading Device A (the offline mode BIG-IP 1 system)	<p>Device A to offline mode, changing <code>traffic-group-1</code> on Device B to active state.</p> <p>Once Device A is in offline mode, you can upgrade the software on Device A, and then reboot Device A to the location of the new version software image. When Device A completes rebooting, <code>traffic-group-1</code> is in standby state on Device A and in active state on Device B.</p> <hr/> <p>Important: Once Device A reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device A to ensure that traffic groups using the network HSM function properly.</p>
Verifying the upgrade	<p>Finally, you should verify that your active and standby BIG-IP systems are functioning properly.</p>
Configuring module-specific settings	<p>According to your understanding of the configuration and functional changes from the previous version, you can reconfigure any customized module settings.</p>

DSC components

Device service clustering (DSC[®]) is based on a few key components.

Devices

A *device* is a physical or virtual BIG-IP system, as well as a member of a local trust domain and a device group. Each device member has a set of unique identification properties that the BIG-IP[®] system generates.

Device groups

A *device group* is a collection of BIG-IP[®] devices that trust each other and can synchronize, and sometimes fail over, their BIG-IP configuration data. You can create two types of devices groups: A *Sync-Failover* device group contains devices that synchronize configuration data and support traffic groups for failover purposes when a device becomes unavailable. A *Sync-Only* device group contains devices that synchronize configuration data, such as policy data, but do not synchronize failover objects.

Traffic groups

A *traffic group* is a collection of related configuration objects (such as a virtual IP address and a self IP address) that run on a BIG-IP device and process a particular type of application traffic. When a BIG-IP device becomes unavailable, a traffic group can float to another device in a device group to ensure that application traffic continues to be processed with little to no interruption in service.

Device trust and trust domains

Underlying the success of device groups and traffic groups is a feature known as device trust. *Device trust* establishes trust relationships between BIG-IP devices on the network, through mutual certificate-based authentication. A *trust domain* is a collection of BIG-IP devices that trust one another and can therefore synchronize and fail over their BIG-IP configuration data, as well as exchange status and failover messages on a regular basis. A *local trust domain* is a trust domain that includes the local device, that is, the device you are currently logged in to.

Folders

Folders are containers for the configuration objects on a BIG-IP device. For every administrative partition on the BIG-IP system, there is a high-level folder. At the highest level of the folder hierarchy is a folder named `root`. The BIG-IP system uses folders to affect the level of granularity to which it synchronizes configuration data to other devices in the device group.

About traffic groups

A *traffic group* is a collection of related configuration objects, such as a floating self IP address, a virtual IP address, and a SNAT translation address, that run on a BIG-IP® device. Together, these objects process a particular type of application traffic on that device. When a BIG-IP device becomes unavailable, a traffic group floats (that is, fails over) to another device in a device group to ensure that application traffic continues to be processed with little to no interruption in service. In general, a traffic group ensures that when a device becomes unavailable, all of the failover objects in the traffic group fail over to any one of the available devices in the device group.

A traffic group is initially active on the device on which you create it, until the traffic group fails over to another device. For example, if you initially create three traffic groups on Device A, these traffic groups remain active on Device A until one or more traffic groups fail over to another device. If you want an active traffic group to become active on a different device in the device group when failover has not occurred, you can intentionally force the traffic group to switch to a standby state, thereby causing failover to another device.

Only objects with floating IP addresses can be members of a floating traffic group.

An example of a set of objects in a traffic group is an iApps® application service. If a device with this traffic group is a member of a device group, and the device becomes unavailable, the traffic group floats to another member of the device group, and that member becomes the device that processes the application traffic.

Note: *A Sync-Failover device group can support a maximum of 127 floating traffic groups.*

Task summary

The upgrade process involves preparation of the two BIG-IP® devices (Device A and Device B) configured in an active-standby implementation, followed by the installation and verification of the new version software on each device. When you upgrade each device, you perform several tasks. Completing these tasks results in a successful upgrade to the new version software on both BIG-IP devices, with a traffic group configured properly for an active-standby implementation.

Important: *In order to upgrade version 10.0.0 or 10.0.1 to the new version software, you must first upgrade to version 10.1.0 or 10.2.x, and then upgrade version 10.1.0 or 10.2.x to the new version software.*

Preparing BIG-IP modules for an upgrade from version 10.x to the new version software

Before you upgrade the BIG-IP® system from version 10.x to the new version software, you might need to manually prepare settings or configurations for specific modules.

Access Policy Manager system preparation

The Access Policy Manager® system does not require specific preparation when upgrading from version 10.x to the new version software. However, additional configuration might be required after completing the upgrade to the new software version.

Supported high availability configuration for Access Policy Manager

Access Policy Manager is supported in an Active-Standby configuration with two BIG-IP® systems only.

Important: *Access Policy Manager is not supported in an Active-Active configuration.*

Post-upgrade activities

When you complete upgrading to the new version software, you should consider the following feature or functionality changes that occur for the Access Policy Manager systems. Depending on your configuration, you might need to perform these changes after you upgrade your systems.

Feature or Functionality	Description
Sessions	All users currently logged in while the upgrade occurs will need to log in again.
Authentication agents and SSO methods	If you have deployments using ActiveSync or Outlook Anywhere, where the domain name is part of the user name, you should enable the Split domain from username option in the login page agent if the authentication method used in the access policy requires only the user name for authentication. In the BIG-IP® APM® new version software, authentication agents and SSO methods no longer separates the domain name from the user name internally.
iRule for processing URI	<p>If you have deployments where an iRule is used to perform processing on internal access control URI, for example, /my.policy, /myvpn or other URIs such as APM system's login page request, you need to enable the iRule events for internal access control URIs because by default, BIG-IP APM new version software does not raise iRule events for internal access control URIs. However, this can be achieved by adding the following code to the iRule:</p> <pre data-bbox="909 1480 1461 1606"> when CLIENT_ACCEPTED { ACCESS::restrict_irule_events disable } </pre>
OAM support	Manually remove all the OAM server-related configurations and reconfigure OAM on BIG-IP APM new version software. OAM configuration is modified to support various OAM 11G related use cases.
Citrix support functionality	The Citrix iRule is no longer visible to the administrator because it is integrated natively in BIG-IP APM new version software. If you have not modified the iRule, then you must enable the Citrix

Feature or Functionality	Description
Reporting functionality	<p>Support setting on the virtual server to use Citrix. If you modified the F5-provided Citrix support iRule and want to use the modified iRule, you need to contact F5 support and work with them to replace natively integrated iRules® with your own version of Citrix-supported iRules®.</p> <p>If you used the <code>adminreports.pl</code> script for your logging or reporting purposes, this script is no longer available in BIG-IP APM new version software. You need to migrate to the new and enhanced reporting and logging functionality available as a built-in functionality on the new software version.</p>

Application Security Manager system preparation

The BIG-IP® Application Security Manager™ (ASM™) system does not require specific preparation when upgrading from version 10.x to the new version software. No additional configuration is required after completing the upgrade to the new software version.

What to expect after upgrading a redundant system

If you update two redundant systems that are running as an active-standby pair with BIG-IP Application Security Manager (ASM) and BIG-IP® Local Traffic Manager™ (LTM®) provisioned, the system maintains the active-standby status and automatically creates a Sync-Failover device group and a traffic group containing both systems. The device group is enabled for BIG-IP ASM (because both systems have ASM provisioned).

You can manually push or pull the updates (including BIG-IP LTM and ASM configurations and policies) from one system to the other (**Device Management > Overview**, click the name of a device, and choose **Sync Device to Group** or **Sync Group to Device**).

Global Traffic Manager system preparation and configuration

BIG-IP® Global Traffic Manager™ systems require specific preparation tasks and changes to upgrade from version 10.x to the new version software.

Preparation Activities

Before you upgrade Global Traffic Manager systems that are in a synchronization group, from any software version to the new version software, you must install the software on an inactive volume on each device using Live Install. After you upgrade each device, you then switch all devices to the new volume at the same time. This is required because devices in a synchronization group that includes the new version software device, cannot effectively probe each other.

Post-upgrade changes

The following feature or functionality changes occur after you complete the upgrade process to the new version software:

Feature or Functionality	Description
Assigning a BIG-IP system to probe a server to gather health and performance data	Assigning a single BIG-IP system to probe a server to gather health and performance data, in version 10.x, is replaced by a Prober pool in the new software version.

Link Controller system preparation

The BIG-IP® Link Controller™ (LC™) system does not require specific preparation when upgrading from version 10.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

Local Traffic Manager system preparation

The BIG-IP® Local Traffic Manager™ (LTM®) system does not require specific preparation when upgrading from version 10.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

MAC masquerade addresses for VLANs

Note: If you configured **MAC Masquerade** addresses for VLANs on the version 10.x devices, one of the addresses will be included automatically in the **MAC Masquerade Address** field for **traffic-group-1** during the upgrade.

HTTP Class profiles

F5 Networks® replaced the HTTP Class profile in BIG-IP® version 11.4.0, and later, with the introduction of the Local Traffic Policies feature. During an upgrade to BIG-IP version 11.4.0, if your configuration contains an HTTP Class profile, the BIG-IP system attempts to migrate the HTTP Class profile to an equivalent local traffic policy. For additional support information regarding the change of HTTP Class profiles to Local Traffic Policies, refer to SOL14409 on www.askf5.com.

WebAccelerator module preparation and configuration

BIG-IP® WebAccelerator modules require specific preparation tasks and changes to upgrade from version 10.x to the new version software.

Preparation activities

Before you upgrade the BIG-IP® WebAccelerator™ modules from version 10.x to an Application Acceleration Manager new software version, you need to prepare the systems, based on your configuration. The following table summarizes the applicable tasks that you need to complete.

Feature or Functionality	Preparation Task
Symmetric deployment	You must reconfigure symmetric WebAccelerator modules as asymmetric systems before you upgrade them from version 10.x to the new version software.
Unpublished policies	You must publish any policies that you want to migrate to the new software version. Only published policies are migrated into the new version software.
Signed policies	Signed policies are not supported in the new version software. If you use signed policies, you must replace them with predefined or user-defined policies before upgrading.
Configuration files	Upgrading from version 10.x to the new version software does not include custom changes to configuration files. After upgrading to the new version software, you need to manually restore any customizations made to your configuration files by

Feature or Functionality	Preparation Task
Debug Options	<p>using the Configuration utility or Traffic Management Shell (tmsh). The following list includes examples of configuration files that might have been customized:</p> <ul style="list-style-type: none"> • /config/wa/globalfragment.xml.10.x.0; in the new software version, all objtype entries are provided in tmsh. • /config/wa/pvsystem.conf.10.x.0 • /config/wa/pvsystem.dtd.10.x.0 • /config/wa/transforms/common.zip.10.x.0; the new software version does not include transforms. <p>X-PV-Info response headers in version 10.x are changed to X-WA-Info response headers in the new software version. The default setting for X-WA-Info Headers is None (disabled). To use X-WA-Info response headers, you will need to change this setting, and update any associated iRules® or scripts, accordingly.</p>

Post-upgrade activities

When you complete upgrading to the new version software, you should consider the following feature or functionality changes that occur for the Application Acceleration Manager modules. Depending upon your configuration, you might need to perform these changes after you upgrade the systems.

Feature or Functionality	Description
Web acceleration	<p>Web acceleration functionality requires configuration of the Web Acceleration profile.</p> <hr/> <p>Important: You must enable an Application Acceleration Manager module application in the Web Acceleration profile to enable the Application Acceleration Manager module.</p> <hr/>
Compression	<p>Compression functionality requires configuration of the HTTP Compression profile in the new version software.</p>
Request logging	<p>Request logging does not migrate to the new version software. You must recreate the configuration after upgrading by using the Request Logging profile.</p>
Policy logging	<p>Policy logging does not migrate to the new version software. You must recreate the configuration after upgrading by using the Request Logging profile.</p>
URL normalization	<p>URL normalization is not supported in the new version software.</p>
ESI functionality	<p>Edge Side Include (ESI) functionality in the Application Acceleration Manager module is not supported in the new version software, with the exception of ESI invalidations.</p>

Feature or Functionality	Description
iControl® backward compatibility	Backward compatibility for iControl Compression and RAM Cache API settings in the HTTP profile is not supported in the new version software. These settings appear in the HTTP Compression and Web Acceleration profiles in the new software version.

WAN Optimization Manager preparation

BIG-IP® WAN Optimization Manager™ (WOM®) systems do not require specific preparation when upgrading from version 10.x to the new version software. However, in a redundant system configuration, you must upgrade the standby system first (to avoid interrupting traffic on the active system), and then upgrade the other system. No additional configuration is required after completing the upgrade to the new version software.

Preparing BIG-IP active-standby systems for an upgrade

The following prerequisites apply when you upgrade BIG-IP® active and standby devices from version 10.x to the new version software.

- The BIG-IP systems (Device A and Device B) are configured as an active-standby pair.
- Each BIG-IP device is running the same version of 10.x software.
- The BIG-IP active-standby devices are the same model of hardware.

When you upgrade a BIG-IP active-standby pair from version 10.x to the new version software, you begin by preparing the devices.

***Note:** If you prefer to closely observe the upgrade of each device, you can optionally connect to the serial console port of the device that you are upgrading.*

1. For each device, complete the following steps to prepare the configuration and settings.
 - a) Examine the Release Notes for specific configuration requirements, and reconfigure the systems, as necessary.
For example, you must reconfigure version 10.x symmetric BIG-IP® WebAccelerator™ modules as asymmetric systems before upgrading to the new version software.
 - b) Examine the Release Notes for specific changes to settings that occur when upgrading from version 10.x to the new version software, and complete any in-process settings.
For example, you must publish any unpublished WebAccelerator module policies in order for them to migrate to the new software version.
2. From the device that is running the latest configuration, synchronize the configuration to the peer unit.
 - a) On the Main menu, click **System > High Availability > ConfigSync**.
A message appears for the Status Message.
 - b) Click **Synchronize TO Peer**.
3. For each device, click **System > High Availability > Redundancy**, and, from the **Redundancy State Preference** list, select **None**.
4. For each device, create a backup file.
 - a) Access the `tmsh` command line utility.
 - b) At the prompt, type `save /sys ucs /shared/filename.ucs`.

- c) Copy the backup file to a safe location on your network.

Note: For additional support information about backing up and restoring BIG-IP system configuration files, refer to SOL11318 on www.askf5.com.

5. Download the BIG-IP new version software .iso file, and, if available, the latest hotfix .iso file from the AskF5™ downloads web site (<https://downloads.f5.com>) to a preferred location.
6. Using a tool or utility that computes an md5 checksum, verify the integrity of the downloaded BIG-IP .iso file.
7. Import either the latest BIG-IP hotfix image file, if available, or the new version software image file to each device.

Option	Description
Import the latest BIG-IP system hotfix image file	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List > Import. 2. Click Browse, locate and click the image file, click Open, and click Import. 3. When the hotfix image file completes uploading to the BIG-IP device, click OK. A link to the image file appears in the Software Image list.
Import the new version software image file	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List > Import. 2. Click Browse, locate and click the image file, click Open, and click Import. 3. When the software image file completes uploading to the BIG-IP device, click OK. A link to the image file appears in the Software Image list.

The BIG-IP devices are prepared to install the latest hotfix or new version software onto Device B (the standby BIG-IP 2 device).

Upgrading the standby BIG-IP 2 system

The following prerequisites apply for this task.

- Device A (the active BIG-IP® 1 system) and Device B (the standby BIG-IP 2 system) must be prepared to upgrade Device B with the new software version software.
- Either the latest hotfix image file, if available, or the new version software image file is downloaded and accessible.

After you prepare Device A (the active BIG-IP 1 system) and Device B (the standby BIG-IP 2 system) for upgrading the software, you force Device B offline, reactivate the software license, and install the new version software onto Device B.

1. Force Device B to offline mode.
 - a) On the Main menu, click **System > High Availability > Redundancy**.
 - b) Click **Force Offline**.
The BIG-IP device (Device B) changes to offline mode.
2. Reactivate the software license.

- a) On the Main menu, click **System > License**.
- b) Click **Re-activate**.
- c) For the **Activation Method** setting, select the **Automatic** (requires outbound connectivity) option.
- d) Click **Next**.
The BIG-IP software license renews automatically.
- e) Click **Continue**.

3. Install either the latest hotfix image, if available, or the new software version.

Option	Description
Install the latest hotfix image	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List. 2. In the Available Images area, select the check box for the hotfix image, and click Install. The Install Software Hotfix popup screen opens. 3. From the Volume set name list, select the location of the new version software volume to install the hotfix image, and click Install.

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

Install the new version software	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List. 2. In the Available Images area, select the check box for the new software version image, and click Install. The Install Software Image popup screen opens. 3. From the Volume set name list, select a location to install the image, and click Install.
---	--

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

4. Reboot the device to the location of the installed new version software software image.

***Important:** Once Device B reboots, if the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device B before upgrading Device A, to ensure that traffic groups using the network HSM function properly.*

- a) On the Main menu, click **System > Software Management > Boot Locations**.
- b) In the **Boot Location** list, click the boot location of the installed new version software software image.
- c) Click **Activate**.

The BIG-IP device reboots to the new version software boot location with `traffic-group-1` in standby state.

***Note:** If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.*

The new version software is installed on Device B, with `traffic-group-1` in standby state.

Upgrading the active BIG-IP 1 system

The following prerequisites apply in upgrading Device A (the BIG-IP® 1 system).

- Device A (the version 10.x BIG-IP 1 system) must be prepared to upgrade to the new version software.
- Device A is in active mode.
- Device B (the the new version software BIG-IP device with traffic-group-1) is in standby state.
- The new version software image file is downloaded and available.
- If available, the latest hotfix image file is downloaded and available.

After you prepare Device A (the standby BIG-IP 1 system) for upgrading the software, you can perform these steps to upgrade to the new version software.

1. Force Device A to offline mode.

- a) On the Main menu, click **System > High Availability > Redundancy**.
- b) Click **Force Offline**.

The BIG-IP device (Device A) changes to offline mode and the peer BIG-IP device (Device B) changes to active state.

Important: *Once the peer BIG-IP device (Device B) changes to active state, ensure that it passes traffic normally.*

2. Reactivate the software license.

- a) On the Main menu, click **System > License**.
- b) Click **Re-activate**.
- c) For the **Activation Method** setting, select the **Automatic (requires outbound connectivity)** option.
- d) Click **Next**.

The BIG-IP software license renews automatically.

- e) Click **Continue**.

3. Install either the latest hotfix image, if available, or the new version software.

Option	Description
---------------	--------------------

- | | |
|--|--|
| Install the latest hotfix image | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List. 2. In the Available Images area, select the check box for the hotfix image, and click Install. The Install Software Hotfix popup screen opens. 3. From the Volume set name list, select the location of the new version software volume to install the hotfix image, and click Install. |
|--|--|

Important: *In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

- | | |
|---|--|
| Install the new version software | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List. 2. In the Available Images area, select the check box for the new version software image, and click Install. The Install Software Image popup screen opens. 3. From the Volume set name list, select a location to install the image, and click Install. |
|---|--|

Option	Description
--------	-------------

Important: In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.

4. Reboot the BIG-IP device (Device A) to the location of the installed new version software image.
 - a) On the Main menu, click **System > Software Management > Boot Locations**.
 - b) In the **Boot Location** list, click the boot location of the installed the new version software image.
 - c) Click **Activate**.

The BIG-IP device (Device A) reboots to the new version software boot location with traffic-group-1 in standby state.

Note: If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.

5. On the Main tab, click **Device Management > Overview**.
6. In the Devices area of the screen, in the Sync Status column, select the device that shows a sync status of **Changes Pending**.
7. In the Sync Options area of the screen, select **Sync Device to Group**.
8. Click **Sync**.

The new version software is installed on Device A (the BIG-IP system with traffic-group-1 in standby state).

Verifying a BIG-IP active-standby upgrade

When you have completed upgrading the BIG-IP active-standby pair from version 10.x to the new version software, you should verify that the upgraded configuration is working properly. Perform the following steps to verify the new version software upgrade.

1. Verify the Platform configuration for each device.
 - a) On the Main menu, click **System > Platform**.
 - b) For the **Root Folder Device Group** setting, verify that the device group is identical on the pair of devices.
 - c) From the **Root Folder Group** list, verify that the correct traffic group (**traffic-group-1**) is selected.
2. Verify the configuration for each device.
 - a) On the Main menu, click **Device Management > Devices**.
 - b) Verify the following information for the device and the peer device.
 - active-standby status
 - device name
 - management IP address
 - hostname
 - TMOS version
 - c) On the Main menu, click **Device Management > Device Trust > Peer List**.

- d) Verify that the peer device is specified as a Peer Authority Device.

Note: Ensure that all information for the peer device appears correctly and complete.

3. Verify the traffic groups for each device.
 - a) On the Main menu, click **Device Management** > **Traffic Groups**.
 - b) Click **traffic-group-1**.
 - c) If you configured **MAC Masquerade** addresses for VLANs on the version 10.x devices, verify that the **traffic-group-1** includes an address in the **MAC Masquerade Address** field.
 - d) Verify that the floating traffic group is correct.
 - e) Verify that the failover objects are correct.
4. Verify the Current ConfigSync State for each device.
 - a) On the Main menu, click **Device Management** > **Overview**.
 - b) In the Devices area of the screen, in the Sync Status column, verify that each device shows a sync status of green.

Implementation result

Your upgrade of the BIG-IP® active-standby pair from version 10.x to the new version software is now complete. The new version software configuration includes a device group with two devices (Device A and Device B) and a traffic group (`traffic-group-1`), with the traffic group on one device (Device B) in active state and the traffic group on the other device (Device A) in standby state.

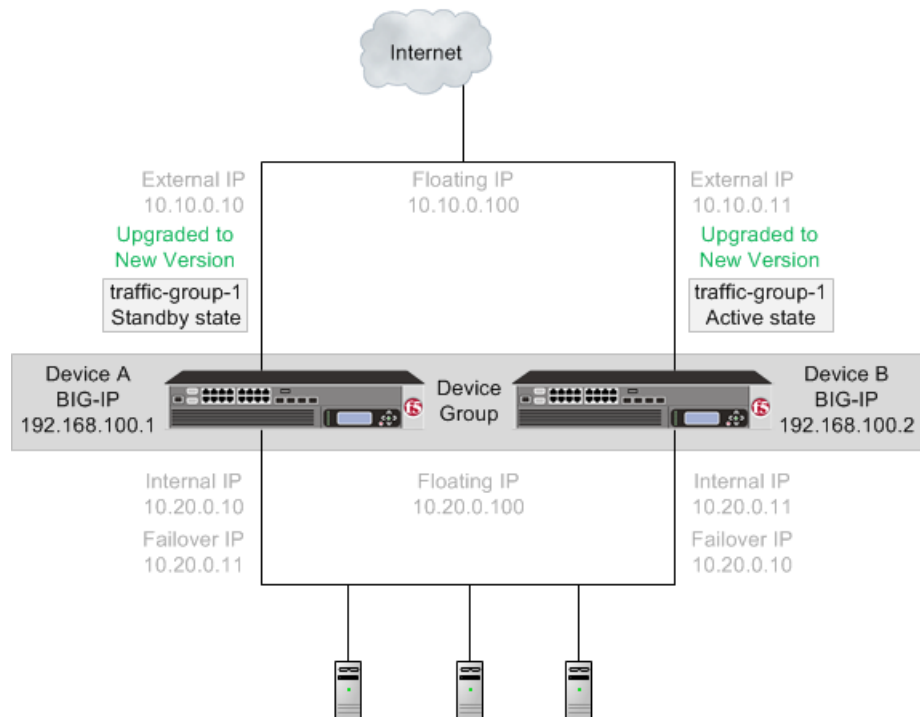


Figure 4: A new version software device group and traffic group

Index

A

- active-standby software upgrade
 - overview [19](#)
 - preparing BIG-IP system [28](#)
 - results [33](#)
 - task summary [23](#)
- active-standby systems
 - upgrading [19](#)
- availability
 - during failover [23](#)

B

- BIG-IP system
 - preparing for upgrade [28](#)
 - upgrading active BIG-IP 1 system [31](#)
 - upgrading standby BIG-IP 2 system [29](#)
 - upgrading to version 11.x [29](#), [31](#)
- BIG-IP system version 11.x upgrade
 - verifying [32](#)

D

- device availability
 - defined [23](#)
- device groups
 - defined [22](#)
- device objects
 - defined [22](#)
- devices
 - defined [22](#)
 - selecting for failover [23](#)
- device trust
 - defined [22](#)

F

- failover
 - and traffic groups [23](#)
- folders
 - defined [22](#)

M

- migration
 - preparation [25–26](#)
 - preparation for APM [24](#)
 - WA preparation [26](#)
 - WOM preparation [28](#)

T

- traffic groups
 - defined [22–23](#)
 - maximum number supported [23](#)

U

- upgrading
 - and ASM [25](#)
 - and two redundant ASM systems [25](#)
 - preparation [25–26](#)
 - preparation for APM [24](#)
 - WA preparation [26](#)
 - WOM preparation [28](#)

V

- version 11.x upgrade
 - preparing BIG-IP modules [23](#)

