

# GeneXpert® Security Guidelines

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# Preface

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## Technical Assistance

Before contacting Cepheid Technical Support, collect the following information:

- Product name
- Serial number of the instrument
- Error messages (if any)
- Software version and, if applicable, Computer Service Tag number

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South Africa	+27 86122 76 35	support@cepheideurope.com
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Contact information for other Cepheid offices is available on our website at [www.cepheid.com](http://www.cepheid.com), [www.cepheidjapan.com](http://www.cepheidjapan.com) or [www.cepheidinternational.com](http://www.cepheidinternational.com) under the **SUPPORT** tab. Select the **Contact Us** option.



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# 1 Introduction

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## 1.1 Overview

Cepheid develops, manufactures, and markets the world's leading on-demand molecular diagnostic systems and tests. Ensuring the integrity of our systems and the business continuity of our customers is a top concern for Cepheid. This *GeneXpert® Security Guidelines* document provides a “best practices” guide to assist our customer's information technology (IT) staff where Cepheid diagnostic products are in use.

## 1.2 Purpose

These best-practice recommendations are intended to increase the overall security posture of the environment where Cepheid diagnostic systems are installed and operated.

Adherence to these recommendations will reduce the overall risk of security threats to computer-based assets.

## 1.3 Background

Connectivity creates opportunities and challenges for users.

## 1.4 Audience

The intended audience for this document includes GeneXpert system users, systems administrator, network administrators, and security personnel.



## 2 Equipment and Software

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### 2.1 Physical Location Security

GeneXpert computers should be in a location secured with badge access.

GeneXpert computers may be physically secured with a cable lock.

### 2.2 Operating System Users

Limiting account privileges provides simple but effective protection when working on the GeneXpert system. Standard accounts (sometimes called limited accounts) allow most daily activities but do not allow a user to install software or make certain changes to the computer.

Users may install/upgrade Cepheid software following the instructions provided on the respective installation media:

- 301-8398, GeneXpert Dx Installation Instructions
- 301-0045, GeneXpert Dx Operator Manual

A laboratorian can run tests on the GeneXpert system using a standard user account and can access files in the GeneXpert folder on the desktop.

### 2.3 Operating System Patches

Microsoft is constantly releasing critical updates and fixes for Windows. Cepheid will publish a list of validated operating system patches annually. Customers may also download and test patches on a more frequent basis:

- Select **‘Check for updates but let me choose whether to download and install them’**.
- Do not check **‘Give me recommended updates the same way I receive important updates’**.
- Do not check **‘Allow all users to install updates on this computer’**
- Do not check **‘Give me updates for other Microsoft products when I update Windows’**
- Do not check **‘Show me detailed notifications when new Microsoft software is available’**
- If you choose to patch your system, then schedule for a time when the system is not in use and reboot the system after patches are installed.

## 2.4 Disk Encryption

Cepheid has not validated and does not support disk encryption on GeneXpert computers.

Customer assumes the risk and cost for acquiring third party disk encryption software.

Customer is responsible for validating such software.

## 2.5 Antivirus

Customers should run antivirus software on the GeneXpert system computer and ensure that the virus definitions are always up to date.

Customers should schedule antivirus updates when the system is not in use.

Customers should schedule Quick or Full Scans when the system is not in use.

Customers can use any antivirus validated by Cepheid:

- At this time, these are Norton Security, McAfee and Windows Defender. Please refer to GeneXpert Operator Manual (P/N 301-0045), for more information.

## 2.6 Anti-Virus Exclusions

An anti-virus exclusion is a user-defined configuration that instructs an anti-virus program to exclude certain files from being scanned to avoid performance issues due to file contention and/or file locking.

**Table 2-1. Exclusions for Xpertise 4.x on Windows 7**

Program	Properties	Scope
Javaw, Java	C:\Program Files\Cepheid\GeneXpert 4.0\JRE\bin	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Bcserver	C:\Program Files\Cepheid\GeneXpert 4.0\tools\bcserver.exe	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).

**Table 2-2. Exclusions for Xpertise 6.x on Windows 7**

Program	Properties	Scope
Javaw, Java	C:\Program Files\Cepheid\GeneXpert 6.x\JRE\bin	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Bcserver	C:\Program Files\Cepheid\GeneXpert 6.x\bin	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
InfShutdown	C:\Program Files\Cepheid\GeneXpert 6.x\bin	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).

**Table 2-3. Exclusions for GeneXpert Dx on Windows**

Program	Properties	Scope
Javaw, Java	C:\Program Files\Cepheid\GeneXpert 4.0\JRE\bin	WinXP: Any computer (including those on the internet). Win7: "Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).

**Table 2-4. Exclusions for Xpress on Windows 7**

Program	Properties	Scope
Javaw, Java	C:\Program Files\Cepheid\GeneXpert 4.x\JRE\bin	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).

## 2.7 Firewall Exclusions

### Note

The following exclusions must be added to the firewall if the customer replaces Norton or McAfee with another Firewall such as Microsoft Windows.

**Table 2-5. Firewall Exclusions for all GeneXpert Systems**

Program	Properties	Scope
GeneXpert Dx /Xpertise	UDP Port: 1207	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
SQL Server Express	TCP Port: 1433	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
InfinityServer (Barcode Scanner)	TCP Port: 2009	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Infinity Kiosk (Barcode Scanner)	TCP Port: 3009	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Cepheid Remote Access (Cisco WebEx)	TCP Port: 443	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Cepheid C360	TCP Port: 80, 443, 8080, 8081	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).
Xpert Check	TCP Port: 9096	"Home/Work (Private)" and "Public" and "Domain" (if the computer is defined in domain).

## 2.8 Browser

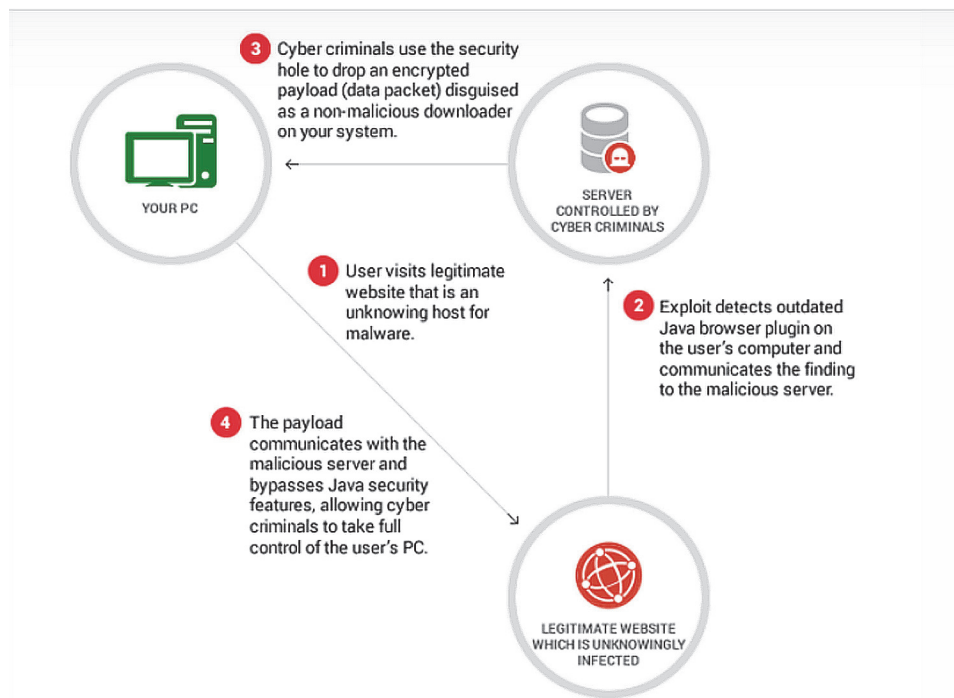
Internet browsers are the first target for cyber criminals, Cepheid recommends that users do not use the GeneXpert computer for any purpose other than running tests.

For greater security, Cepheid recommends that the GeneXpert Computer be operated without (or with minimal) connectivity to the Internet.

## 2.9 Java Questions and Answers

### Potential security problems with Java

The method of attack is the Java Runtime Environment (JRE) plugin in the browser. If a user is surfing the internet and comes across some Java code, the JRE will attempt to run it. If the code is malicious, the code might attempt to alter or copy computer files. See Figure 2-1.



**Figure 2-1. Why Java Browser Plug-In can cause security problems**  
(Source: <https://heimdalsecurity.com/blog/java-biggest-security-hole-your-computer/>)

### Why is it OK for Java to be un-patched on a GeneXpert computer?

The Internet Explorer browser that is pre-loaded on the GeneXpert computer does not have the Java plug-in installed. The GeneXpert / Xpertise software runs locally and does not require the internet. Therefore, the risk level is lower if the Java browser plug-in is not installed.



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## 2.10 SQL Server Questions and Answers

### **In what way are old versions of SQL Server not secure?**

Attacks exploit SQL Server where there are existing network connections.

### **Why is it OK for my SQL Server to be unpatched?**

The GeneXpert / Xpertise software communicates with the local database. There is no network traffic to the database. The GeneXpert / Xpertise database has an embedded password that is not known to users.

### **What if a hot fix or service pack is available through Windows Update?**

Do not update SQL Server with hot fixes or service packs until notified by Cepheid Technical Support. If you apply service packs or hot fixes to SQL Server, then the GeneXpert / Xpertise software will not run.

Please contact Cepheid Technical Support to restore the system to its original state working condition if an accidental update has taken place.

## 2.11 Adobe Questions and Answers

### **In what way are old versions of Adobe Reader not secure?**

GeneXpert systems are preloaded with Adobe Reader IX (validated on Windows XP) or Adobe Reader X (validated on Windows 7) in order to view GeneXpert user documentation provided on the system computer and to view test reports. Adobe Reader IX or X have a known vulnerability through the internet. If a PDF is downloaded and has a web link that points to a malicious site, then Adobe Reader may attempt to download or run malware which could adversely affect the local computer or network.

### **Why is it OK to use Adobe Reader IX or X and not the latest version?**

Adobe Reader is meant for viewing local GeneXpert / Xpertise documentation.

The GeneXpert / Xpertise PDFs do not have web links in them. We recommend that you do not download PDFs from other websites which could have web links in them.

Although Adobe Reader does not impact the functioning of the GeneXpert / Xpertise software, Cepheid is in the process of validating Adobe Reader DC and will inform users when they may upgrade. Adobe Reader DC will be bundled with future versions of GeneXpert / Xpertise software.

## 2.12 Remote Access Questions and Answers

### What is Cepheid Remote Access?

Remote Access allows Cepheid Technical Support engineers to securely access GeneXpert systems at customer sites using internet connectivity.

### What is Remote Access used for?

Cepheid uses Cisco's WebEx Remote Support to provide:

- Screen Sharing – Cepheid can see what the customer sees.
- Remote Control – Cepheid can take control if the customer authorizes.
- File Transfer – Cepheid can review application logs and archive files.

### What is the benefit of Remote Access?

- Remote Access can reduce unplanned service visits.

### How can I minimize risk to the GeneXpert computer?

Access to the system is explicitly granted by the customer. Data transport is encrypted and logged. Cepheid can provide official detailed white papers on Cisco WebEx security.

### What if a customer wants Cepheid to use another solution such as Secure-Link?

Cepheid will use a customer's preferred method for remote access as long as it can accommodate the following functionalities.

- Screen Sharing
- Remote Control
- File Transfer

## 2.13 Locked Out Access

In order to make sure customers maintain access to the GeneXpert application and the relevant data stored therein, Cepheid's Technical Support has the ability to provide temporary access to a customer's authorized user to unlock the application in case of an inadvertent lock-out.

Cepheid validates authorized users by verifying the institution account details as maintained in Cepheid's ERP system.

## 2.14 Additional Information

- Please refer to the operator's manual for additional information and please contact Cepheid Technical Support if you have any questions.
- Customers may send IT questionnaires to Cepheid Technical Support.



# A Windows Security Updates

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The following tables provide a summary of the Windows Operating System updates which were installed for the validation testing of GeneXpert Dx 5.1. The following Windows environments were tested: Windows XP, Windows 7 32-bit, Windows 7 64-bit, and Windows 10.

**Table A-1. Security Updates - Windows XP - Service Pack 4**

Description	HotFixID	Installed On
Security Update	KB2510531-IE8	4/14/2015
Update	KB2598845-IE8	4/14/2015
Update	KB2632503-IE8	4/14/2015
Security Update	KB2909210-IE8	4/14/2015
Security Update	KB2909921-IE8	4/14/2015
Security Update	KB2936068-IE8	4/14/2015
Security Update	KB2964358-IE8	4/14/2015
Security Update	KB982381-IE8	4/14/2015
Security Update	KB2564958	4/14/2015
Update	MSCompPackV1	4/14/2015
Update	KB898461	4/14/2015
Service Pack Update	KB936929	2/5/2010
Security Update	KB2115168	4/14/2015
Security Update	KB2229593	4/14/2015
Security Update	KB2296011	4/14/2015
Update	KB2345886	4/14/2015
Security Update	KB2347290	4/14/2015
Security Update	KB2387149	4/14/2015
Security Update	KB2393802	4/14/2015
Security Update	KB2419632	4/14/2015
Security Update	KB2423089	4/14/2015
Security Update	KB2443105	4/14/2015
Update	KB2467659	4/14/2015
Security Update	KB2478960	4/14/2015
Security Update	KB2478971	4/14/2015
Security Update	KB2479943	4/14/2015
Security Update	KB2481109	4/14/2015
Security Update	KB2483185	4/14/2015
Security Update	KB2485663	4/14/2015
Security Update	KB2491683	4/14/2015
Update	KB2492386	4/14/2015

**Table A-1. Security Updates - Windows XP - Service Pack 4**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Security Update	KB256212	4/14/2015
Security Update	KB257938	4/14/2015
Security Update	KB258429	4/14/2015
Security Update	KB259553	4/14/2015
Security Update	KB2510581	4/14/2015
Security Update	KB2535512	4/14/2015
Security Update	KB2536276-v2	4/14/2015
Security Update	KB2544893-v2	4/14/2015
Security Update	KB2566454	4/14/2015
Security Update	KB2570947	4/14/2015
Security Update	KB2584146	4/14/2015
Security Update	KB2585542	4/14/2015
Security Update	KB2592799	4/14/2015
Security Update	KB2598479	4/14/2015
Security Update	KB2603381	4/14/2015
Security Update	KB2619339	4/14/2015
Security Update	KB2620712	4/14/2015
Security Update	KB2631813	4/14/2015
Security Update	KB2653956	4/14/2015
Security Update	KB2655992	4/14/2015
Security Update	KB2659262	4/14/2015
Security Update	KB2661637	4/14/2015
Security Update	KB2676562	4/14/2015
Security Update	KB2686509	4/14/2015
Security Update	KB2691442	4/14/2015
Security Update	KB2698365	4/14/2015
Security Update	KB2705219-v2	4/14/2015
Security Update	KB2712808	4/14/2015
Security Update	KB2719985	4/14/2015
Security Update	KB2723135-v2	4/14/2015
Security Update	KB2727528	4/14/2015
Update	KB2749655	4/14/2015
Security Update	KB2757638	4/14/2015
Security Update	KB2770660	4/14/2015
Security Update	KB2780091	4/14/2015
Security Update	KB2802968	4/14/2015
Security Update	KB2807986	4/14/2015
Update	KB2808679	4/14/2015
Security Update	KB2813345	4/14/2015
Security Update	KB2820917	4/14/2015

Table A-1. Security Updates - Windows XP - Service Pack 4

Description	HotFixID	Installed On
Security Update	KB2834886	4/14/2015
Security Update	KB2847311	4/14/2015
Security Update	KB2850869	4/14/2015
Security Update	KB2859537	4/14/2015
Security Update	KB2862152	4/14/2015
Security Update	KB2862330	4/14/2015
Security Update	KB2862335	4/14/2015
Security Update	KB2864063	4/14/2015
Security Update	KB2868038	4/14/2015
Security Update	KB2868626	4/14/2015
Security Update	KB2876217	4/14/2015
Security Update	KB2876331	4/14/2015
Security Update	KB2892075	4/14/2015
Security Update	KB2893294	4/14/2015
Security Update	KB2898715	4/14/2015
Security Update	KB2900986	4/14/2015
Update	KB2904266	4/14/2015
Security Update	KB2909212	4/14/2015
Security Update	KB2914368	4/14/2015
Security Update	KB2916036	4/14/2015
Security Update	KB2922229	4/14/2015
Security Update	KB2929961	4/14/2015
Security Update	KB2930275	4/14/2015
Update	KB2934207	4/14/2015
Security Update	KB2936068	4/14/2015
Security Update	KB2964358	4/14/2015
Hotfix	KB915800-v4	4/14/2015
Security Update	KB923561	4/14/2015
Hotfix	KB942288-v3	10/11/2017
Security Update	KB946648	4/14/2015
Security Update	KB950762	4/14/2015
Security Update	KB950974	4/14/2015
Security Update	KB951376-v2	4/14/2015
Update	KB951978	4/14/2015
Security Update	KB952004	4/14/2015
Hotfix	KB952287	4/14/2015
Security Update	KB952954	4/14/2015
Hotfix	KB954550-v5	4/14/2015
Security Update	KB956572	4/14/2015
Security Update	KB956844	4/14/2015

**Table A-1. Security Updates - Windows XP - Service Pack 4**

Description	HotFixID	Installed On
Security Update	KB959426	4/14/2015
Security Update	KB96803	4/14/2015
Security Update	KB96859	4/14/2015
Hotfix	KB961118	4/14/2015
Update	KB968389	4/14/2015
Security Update	KB969059	4/14/2015
Security Update	KB97430	4/14/2015
Update	KB971029	4/14/2015
Security Update	KB971657	4/14/2015
Security Update	KB972270	4/14/2015
Security Update	KB973507	4/14/2015
Update	KB973815	4/14/2015
Security Update	KB973869	4/14/2015
Security Update	KB973904	4/14/2015
Security Update	KB974112	4/14/2015
Security Update	KB974318	4/14/2015
Security Update	KB974392	4/14/2015
Security Update	KB974571	4/14/2015
Security Update	KB975025	4/14/2015
Security Update	KB975467	4/14/2015
Security Update	KB975560	4/14/2015
Security Update	KB975713	4/14/2015
Security Update	KB977816	4/14/2015
Security Update	KB977914	4/14/2015
Security Update	KB978338	4/14/2015
Security Update	KB978542	4/14/2015
Security Update	KB978706	4/14/2015
Security Update	KB979309	4/14/2015
Security Update	KB979482	4/14/2015
Security Update	KB979687	4/14/2015
Security Update	KB981997	4/14/2015
Security Update	KB982132	4/14/2015
Security Update	KB982665	4/14/2015
Update	KB835221WXP	10/5/2007



**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

Description	HotFixID	Installed On
Update	KB2849697	4/17/2016
Update	KB2849696	4/17/2016
Update	KB2841134	4/17/2016
Update	KB2670838	4/17/2016
Update	KB2830477	4/17/2016
Update	KB2592687	4/17/2016
Update	KB3134760	4/17/2016
Security Update	KB2479943	4/17/2016
Security Update	KB2491683	4/17/2016
Hotfix	KB2496898	4/17/2016
Hotfix	KB2505454	4/17/2016
Security Update	KB2506212	4/17/2016
Update	KB2506928	4/17/2016
Security Update	KB2509553	4/17/2016
Security Update	KB2511455	4/17/2016
Update	KB2533552	4/17/2016
Security Update	KB2536275	4/17/2016
Security Update	KB2544893	4/17/2016
Update	KB2545698	4/17/2016
Update	KB2547666	4/17/2016
Update	KB2552343	4/17/2016
Security Update	KB2560656	4/17/2016
Update	KB2563227	4/17/2016
Security Update	KB2564958	4/17/2016
Security Update	KB2570947	4/17/2016
Update	KB2574819	4/17/2016
Security Update	KB2579686	4/17/2016
Security Update	KB2585542	4/17/2016
Hotfix	KB2589986	4/17/2016
Security Update	KB2604115	4/17/2016
Security Update	KB2620704	4/17/2016
Security Update	KB2621440	4/17/2016
Security Update	KB2631813	4/17/2016
Hotfix	KB2639308	4/17/2016
Update	KB2640148	4/17/2016
Update	KB2647753	4/17/2016
Security Update	KB2654428	4/17/2016
Update	KB2660075	4/17/2016
Security Update	KB2667402	4/17/2016

**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB2676562	4/17/2016
Update	KB2685811	4/17/2016
Update	KB2685813	4/17/2016
Security Update	KB2690533	4/17/2016
Security Update	KB2698365	4/17/2016
Security Update	KB2705219	4/17/2016
Security Update	KB2712808	4/17/2016
Update	KB2719857	4/17/2016
Update	KB2726535	4/17/2016
Security Update	KB2727528	4/17/2016
Update	KB2729094	4/17/2016
Update	KB2732059	4/17/2016
Update	KB2732487	4/17/2016
Security Update	KB2736422	4/17/2016
Security Update	KB2742599	4/17/2016
Update	KB2750841	4/17/2016
Update	KB2761217	4/17/2016
Update	KB2763523	4/17/2016
Security Update	KB2770660	4/17/2016
Update	KB2773072	4/17/2016
Update	KB2786081	4/17/2016
Update	KB2799926	4/17/2016
Update	KB2800095	4/17/2016
Security Update	KB2807986	4/17/2016
Update	KB2808679	4/17/2016
Security Update	KB2813347	4/17/2016
Security Update	KB2813430	4/17/2016
Update	KB2820331	4/17/2016
Update	KB2834140	4/17/2016
Security Update	KB2839894	4/17/2016
Security Update	KB2840631	4/17/2016
Update	KB2843630	4/17/2016
Security Update	KB2847927	4/17/2016
Update	KB2852386	4/17/2016
Update	KB2853952	4/17/2016
Update	KB2857650	4/17/2016
Security Update	KB2861698	4/17/2016
Security Update	KB2862152	4/17/2016
Security Update	KB2862330	4/17/2016
Security Update	KB2862335	4/17/2016

**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Security Update	KB2864202	4/17/2016
Security Update	KB2868038	4/17/2016
Update	KB2868116	4/17/2016
Security Update	KB2871997	4/17/2016
Security Update	KB2884256	4/17/2016
Update	KB2888049	4/17/2016
Update	KB2891804	4/17/2016
Security Update	KB2892074	4/17/2016
Security Update	KB2893294	4/17/2016
Update	KB2893519	4/17/2016
Security Update	KB2894844	4/17/2016
Hotfix	KB2895729	4/17/2016
Security Update	KB2900986	4/17/2016
Update	KB2908783	4/17/2016
Security Update	KB2911501	4/17/2016
Security Update	KB2912390	4/17/2016
Update	KB2913431	4/17/2016
Update	KB2918077	4/17/2016
Update	KB2919469	4/17/2016
Update	KB2923545	4/17/2016
Update	KB2929733	4/17/2016
Security Update	KB2931356	4/17/2016
Security Update	KB2937610	4/17/2016
Security Update	KB2943357	4/17/2016
Update	KB2952664	4/17/2016
Security Update	KB2957189	4/17/2016
Update	KB2966583	4/17/2016
Security Update	KB2968294	4/17/2016
Update	KB2970228	4/17/2016
Security Update	KB2972100	4/17/2016
Security Update	KB2972211	4/17/2016
Security Update	KB2973112	4/17/2016
Security Update	KB2973201	4/17/2016
Security Update	KB2973351	4/17/2016
Security Update	KB2976897	4/17/2016
Security Update	KB2977292	4/17/2016
Security Update	KB2978120	4/17/2016
Security Update	KB2978742	4/17/2016
Security Update	KB2984972	4/17/2016
Update	KB2985461	4/17/2016

**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB2991963	4/17/2016
Security Update	KB2992611	4/17/2016
Security Update	KB3003743	4/17/2016
Security Update	KB3004361	4/17/2016
Security Update	KB3004375	4/17/2016
Update	KB3006121	4/17/2016
Hotfix	KB3006137	4/17/2016
Security Update	KB3010788	4/17/2016
Security Update	KB3011780	4/17/2016
Update	KB3013531	4/17/2016
Update	KB3020369	4/17/2016
Update	KB3020370	4/17/2016
Security Update	KB3020388	4/17/2016
Security Update	KB3021674	4/17/2016
Update	KB3021917	4/17/2016
Security Update	KB3022777	4/17/2016
Security Update	KB3023215	4/17/2016
Security Update	KB3030377	4/17/2016
Security Update	KB3033889	4/17/2016
Security Update	KB3033929	4/17/2016
Security Update	KB3035126	4/17/2016
Security Update	KB3035132	4/17/2016
Security Update	KB3037574	4/17/2016
Update	KB3040272	4/17/2016
Security Update	KB3042058	4/17/2016
Security Update	KB3042553	4/17/2016
Security Update	KB3045685	4/17/2016
Security Update	KB3046017	4/17/2016
Security Update	KB3046269	4/17/2016
Update	KB3054476	4/17/2016
Security Update	KB3055642	4/17/2016
Security Update	KB3059317	4/17/2016
Security Update	KB3060716	4/17/2016
Security Update	KB3061518	4/17/2016
Security Update	KB3067903	4/17/2016
Update	KB3068708	4/17/2016
Security Update	KB3071756	4/17/2016
Security Update	KB3072305	4/17/2016
Security Update	KB3072630	4/17/2016
Security Update	KB3074543	4/17/2016

**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Security Update	KB3075226	4/17/2016
Security Update	KB3076949	4/17/2016
Security Update	KB3078601	4/17/2016
Update	KB3078667	4/17/2016
Update	KB3080079	4/18/2016
Update	KB3080149	4/17/2016
Security Update	KB3084135	4/17/2016
Security Update	KB3086255	4/17/2016
Security Update	KB3092601	4/17/2016
Update	KB3092627	4/17/2016
Security Update	KB3093513	4/17/2016
Security Update	KB3097989	4/17/2016
Security Update	KB3101722	4/17/2016
Update	KB3102429	4/18/2016
Update	KB3107998	4/17/2016
Security Update	KB3108371	4/17/2016
Security Update	KB3108381	4/17/2016
Security Update	KB3108664	4/17/2016
Security Update	KB3108669	4/17/2016
Security Update	KB3108670	4/17/2016
Security Update	KB3109094	4/17/2016
Security Update	KB3109103	4/17/2016
Security Update	KB3109560	4/17/2016
Security Update	KB3110329	4/17/2016
Security Update	KB3115858	4/17/2016
Update	KB3118401	4/17/2016
Update	KB3121255	4/17/2016
Security Update	KB3122648	4/17/2016
Security Update	KB3123479	4/17/2016
Update	KB3123862	4/17/2016
Security Update	KB3124001	4/17/2016
Security Update	KB3124280	4/17/2016
Security Update	KB3126446	4/18/2016
Security Update	KB3126587	4/17/2016
Security Update	KB3127220	4/17/2016
Update	KB3133977	4/17/2016
Security Update	KB3135983	4/17/2016
Update	KB3137061	4/17/2016
Update	KB3138612	4/17/2016
Update	KB3138901	4/17/2016

**Table A-2. Security Updates - Windows 7 32-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB3138910	4/17/2016
Security Update	KB3138962	4/17/2016
Security Update	KB3139398	4/17/2016
Security Update	KB3139914	4/17/2016
Update	KB3139923	4/18/2016
Security Update	KB3139940	4/17/2016
Security Update	KB3140735	4/17/2016
Security Update	KB3142042	4/17/2016
Security Update	KB3145739	4/17/2016
Security Update	KB3146706	4/17/2016
Security Update	KB3146963	4/17/2016
Update	KB3147071	4/17/2016
Security Update	KB3148198	4/17/2016
Update	KB3148851	4/17/2016
Security Update	KB3149090	4/17/2016
Update	KB976902	11/20/2010
Update	KB982018	4/17/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

Description	HotFixID	Installed On
Update	KB2849697	2/11/2016
Update	KB2849696	2/11/2016
Update	KB2841134	2/11/2016
Update	KB2670838	2/11/2016
Update	KB971033	2/11/2016
Security Update	KB2479943	2/11/2016
Security Update	KB2491683	2/11/2016
Update	KB2506014	2/11/2016
Security Update	KB2506212	2/11/2016
Update	KB2506928	2/11/2016
Security Update	KB2509553	2/11/2016
Security Update	KB2511455	2/11/2016
Security Update	KB2532531	10/3/2016
Update	KB2533552	2/11/2016
Update	KB2533623	2/11/2016
Hotfix	KB2534111	2/4/2016
Security Update	KB2536275	2/11/2016
Security Update	KB2544893	2/11/2016
Update	KB2545698	2/11/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Update	KB2547666	2/11/2016
Update	KB2552343	2/11/2016
Security Update	KB2560656	2/11/2016
Update	KB2563227	2/11/2016
Security Update	KB2564958	2/11/2016
Security Update	KB2570947	2/11/2016
Security Update	KB2579686	2/11/2016
Security Update	KB2585542	2/11/2016
Update	KB2603229	2/11/2016
Security Update	KB2604115	2/11/2016
Security Update	KB2619339	2/11/2016
Security Update	KB2620704	2/11/2016
Security Update	KB2621440	2/11/2016
Security Update	KB2631813	2/11/2016
Hotfix	KB2639308	2/11/2016
Update	KB2640148	2/11/2016
Security Update	KB2653956	2/11/2016
Security Update	KB2654428	2/11/2016
Security Update	KB2656356	2/11/2016
Update	KB2660075	2/11/2016
Security Update	KB2667402	2/11/2016
Security Update	KB2676562	2/11/2016
Update	KB2685811	2/11/2016
Update	KB2685813	2/11/2016
Security Update	KB2685939	2/11/2016
Security Update	KB2690533	2/11/2016
Security Update	KB2698365	2/11/2016
Security Update	KB2705219	2/11/2016
Security Update	KB2706045	2/11/2016
Security Update	KB2712808	2/11/2016
Update	KB2718704	2/11/2016
Update	KB2719857	2/11/2016
Update	KB2726535	2/11/2016
Security Update	KB2727528	2/11/2016
Update	KB2729094	2/11/2016
Security Update	KB2729452	2/11/2016
Update	KB2731771	2/11/2016
Update	KB2732059	2/11/2016
Update	KB2732487	10/3/2016
Security Update	KB2736422	2/11/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB2742599	2/11/2016
Update	KB2750841	2/11/2016
Security Update	KB2758857	2/11/2016
Update	KB2761217	2/11/2016
Update	KB2763523	2/11/2016
Security Update	KB2770660	2/11/2016
Update	KB2773072	2/11/2016
Update	KB2786081	2/11/2016
Security Update	KB2789645	2/11/2016
Update	KB2791765	2/11/2016
Update	KB2798162	2/11/2016
Update	KB2799926	2/11/2016
Update	KB2800095	2/11/2016
Security Update	KB2807986	2/11/2016
Update	KB2808679	2/11/2016
Security Update	KB2813430	2/11/2016
Update	KB2834140	2/11/2016
Update	KB2836942	2/11/2016
Update	KB2836943	2/11/2016
Security Update	KB2839894	2/11/2016
Security Update	KB2840149	2/11/2016
Security Update	KB2840631	2/11/2016
Update	KB2843630	2/11/2016
Update	KB2846960	2/11/2016
Security Update	KB2847927	2/11/2016
Update	KB2852386	2/5/2016
Update	KB2853952	2/11/2016
Security Update	KB2861698	2/11/2016
Security Update	KB2862152	2/11/2016
Security Update	KB2862330	2/11/2016
Security Update	KB2862335	2/11/2016
Security Update	KB2864202	2/11/2016
Security Update	KB2868038	2/11/2016
Update	KB2868116	2/11/2016
Security Update	KB2868626	2/11/2016
Security Update	KB2871997	2/11/2016
Update	KB2882822	2/11/2016
Security Update	KB2884256	2/11/2016
Update	KB2888049	2/11/2016
Update	KB2891804	2/11/2016



**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Security Update	KB2892074	2/11/2016
Security Update	KB2893294	2/11/2016
Update	KB2893519	2/11/2016
Security Update	KB2894844	2/11/2016
Security Update	KB2900986	2/11/2016
Update	KB2908783	2/11/2016
Security Update	KB2911501	2/11/2016
Security Update	KB2912390	10/3/2016
Update	KB2918077	2/11/2016
Update	KB2919469	2/11/2016
Update	KB2928562	2/11/2016
Update	KB2929733	2/11/2016
Security Update	KB2931356	2/11/2016
Security Update	KB2937610	2/11/2016
Security Update	KB2943357	2/5/2016
Update	KB2952664	10/4/2017
Security Update	KB2957189	2/11/2016
Update	KB2966583	2/11/2016
Security Update	KB2968294	2/11/2016
Update	KB2970228	10/3/2016
Security Update	KB2972100	2/11/2016
Security Update	KB2972211	2/11/2016
Security Update	KB2973112	2/11/2016
Security Update	KB2973201	2/11/2016
Security Update	KB2973351	2/11/2016
Security Update	KB2976897	2/11/2016
Security Update	KB2977292	2/11/2016
Security Update	KB2978120	2/11/2016
Security Update	KB2978742	2/11/2016
Security Update	KB2984972	2/11/2016
Update	KB2985461	2/11/2016
Security Update	KB2991963	2/11/2016
Security Update	KB2992611	2/11/2016
Update	KB2993651	2/11/2016
Update	KB2999226	2/11/2016
Security Update	KB3003743	2/11/2016
Security Update	KB3004361	2/11/2016
Security Update	KB3004375	2/11/2016
Security Update	KB3005607	2/11/2016
Update	KB3006121	2/11/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

Description	HotFixID	Installed On
Hotfix	KB3006137	2/11/2016
Security Update	KB3006226	2/11/2016
Update	KB3006625	2/11/2016
Security Update	KB3010788	2/11/2016
Security Update	KB3011780	2/11/2016
Update	KB3013531	2/11/2016
Security Update	KB3019215	2/11/2016
Security Update	KB3019978	2/11/2016
Update	KB3020338	2/11/2016
Update	KB3020369	2/11/2016
Update	KB3020370	2/11/2016
Security Update	KB3021674	2/11/2016
Update	KB3021917	2/11/2016
Security Update	KB3022777	2/11/2016
Security Update	KB3023215	2/11/2016
Security Update	KB3030377	2/11/2016
Security Update	KB3031432	2/11/2016
Security Update	KB3032655	2/11/2016
Security Update	KB3033889	2/11/2016
Security Update	KB3033890	2/11/2016
Security Update	KB3033929	2/11/2016
Security Update	KB3035126	2/5/2016
Security Update	KB3035132	2/11/2016
Security Update	KB3037574	2/11/2016
Update	KB3040272	2/11/2016
Security Update	KB3042058	10/3/2016
Security Update	KB3042553	2/11/2016
Security Update	KB3045685	2/11/2016
Security Update	KB3046017	2/11/2016
Security Update	KB3046269	2/11/2016
Update	KB3054476	2/11/2016
Security Update	KB3055642	2/11/2016
Security Update	KB3059317	2/11/2016
Security Update	KB3060716	2/11/2016
Security Update	KB3061518	2/11/2016
Security Update	KB3067903	2/11/2016
Update	KB3068708	2/11/2016
Security Update	KB3071756	2/11/2016
Security Update	KB3072305	10/3/2016
Security Update	KB3072630	2/11/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

<b>Description</b>	<b>HotFixID</b>	<b>Installed On</b>
Security Update	KB3072633	2/11/2016
Security Update	KB3074543	2/11/2016
Security Update	KB3075220	2/11/2016
Update	KB3075249	2/11/2016
Security Update	KB3076895	2/11/2016
Security Update	KB3076949	2/11/2016
Security Update	KB3078601	2/11/2016
Update	KB3078667	2/11/2016
Update	KB3080149	2/11/2016
Security Update	KB3080446	2/11/2016
Security Update	KB3084135	2/11/2016
Security Update	KB3086255	2/11/2016
Security Update	KB3087039	2/11/2016
Security Update	KB3092601	2/11/2016
Update	KB3092627	2/11/2016
Security Update	KB3093513	2/11/2016
Security Update	KB3097966	2/11/2016
Security Update	KB3097989	2/5/2016
Security Update	KB3099862	2/11/2016
Security Update	KB3100213	2/11/2016
Security Update	KB3101722	2/11/2016
Update	KB3107998	2/11/2016
Security Update	KB3108371	2/11/2016
Security Update	KB3108381	2/11/2016
Security Update	KB3108664	2/11/2016
Security Update	KB3108669	2/11/2016
Security Update	KB3108670	2/11/2016
Security Update	KB3109094	2/11/2016
Security Update	KB3109103	2/11/2016
Security Update	KB3109560	2/11/2016
Security Update	KB3110329	2/11/2016
Update	KB3112148	2/11/2016
Update	KB3112343	2/11/2016
Security Update	KB3115858	10/3/2016
Update	KB3118401	10/3/2016
Security Update	KB3121212	2/11/2016
Update	KB3121255	10/3/2016
Security Update	KB3121918	2/11/2016
Security Update	KB3122648	10/3/2016
Security Update	KB3123479	2/11/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB3124000	2/11/2016
Security Update	KB3124001	2/11/2016
Security Update	KB3124275	2/11/2016
Security Update	KB3124280	10/3/2016
Security Update	KB3126587	10/3/2016
Security Update	KB3127220	10/3/2016
Update	KB3133977	10/3/2016
Security Update	KB3135983	10/3/2016
Update	KB3137061	10/3/2016
Update	KB3138378	10/3/2016
Update	KB3138612	10/3/2016
Update	KB3138901	10/3/2016
Security Update	KB3138910	10/3/2016
Security Update	KB3138962	10/3/2016
Security Update	KB3139398	10/3/2016
Security Update	KB3139914	10/3/2016
Security Update	KB3139940	10/3/2016
Update	KB3140245	10/3/2016
Security Update	KB3142024	10/3/2016
Security Update	KB3142042	10/3/2016
Security Update	KB3145739	10/3/2016
Security Update	KB3146706	10/3/2016
Security Update	KB3146963	10/3/2016
Update	KB3147071	10/3/2016
Security Update	KB3149090	10/3/2016
Security Update	KB3150220	10/3/2016
Update	KB3150513	10/4/2017
Security Update	KB3155178	10/3/2016
Security Update	KB3156016	10/3/2016
Security Update	KB3156017	10/3/2016
Security Update	KB3156019	10/3/2016
Security Update	KB3159398	10/3/2016
Update	KB3161102	10/3/2016
Security Update	KB3161561	10/3/2016
Security Update	KB3161949	10/3/2016
Security Update	KB3161958	10/3/2016
Security Update	KB3163245	10/3/2016
Security Update	KB3164033	10/3/2016
Security Update	KB3164035	10/3/2016
Security Update	KB3168965	10/3/2016

**Table A-3. Security Updates - Windows 7 64-Bit - Service Pack 1**

Description	HotFixID	Installed On
Security Update	KB3170455	10/3/2016
Update	KB3170735	10/3/2016
Update	KB3172605	10/3/2016
Security Update	KB3175024	10/3/2016
Security Update	KB3177186	10/3/2016
Update	KB3177467	10/4/2017
Security Update	KB3178034	10/3/2016
Update	KB3179573	10/3/2016
Update	KB3181988	10/4/2017
Update	KB3182203	10/3/2016
Security Update	KB3184122	10/3/2016
Update	KB3184143	10/4/2017
Security Update	KB3185319	10/3/2016
Security Update	KB3185911	10/3/2016
Update	KB4019990	10/4/2017
Update	KB4040980	10/4/2017
Update	KB976902	11/21/2010
Update	KB982018	10/3/2016
Security Update	KB4038777	10/4/2017

**Table A-4. Security Updates - Windows 10 - OS: 1703 - Build: 15063.674**

Description	HotFixID	Installed On
Update	KB4022405	7/11/2017
Security Update	KB4025376	7/11/2017
Security Update	KB4038806	9/13/2017
Security Update	KB4038788	9/14/2017

