Assurance Activities Report
for
Veeam Backup & Replication v12

Version 1.0
14 August 2023

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Common Criteria Version:

- Common Criteria for Information Technology Security Evaluation Part 1: Introduction and general model, Version 3.1, Revision 5, April 2017.
- Common Criteria for Information Technology Security Evaluation Part 2: Security functional components, Version 3.1, Revision 5, April 2017.
- Common Criteria for Information Technology Security Evaluation Part 3: Security assurance components, Version 3.1, Revision 5, April 2017.

Common Evaluation Methodology Version:

- Common Methodology for Information Technology Security Evaluation, Evaluation Methodology, Version 3.1, Revision 5, April 2017.

Protection Profiles:

- Protection Profile for Application Software, Version 1.4, 7 October 2021.

Revision History

Version	Date	Description
0.1	28 June 2023	Initial draft
1.0	14 August 2023	Final version for Check-out

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1. Introduction

This document presents the results of performing evaluation activities associated with the Veeam Backup & Replication v12 evaluation. This report contains sections documenting the performance of evaluation activities associated with each of the Security Functional Requirements (SFRs) and Security Assurance Requirements (SARs) as specified in the following document:

- *Protection Profile for Application Software*, Version 1.4, 7 October 2021 [PP_APP_v1.4].

1.1 Technical Decisions

This subsection lists the Technical Decisions that have been issued by NIAP against [PP_APP_v1.4], along with rationale as to their applicability or otherwise to this evaluation.

TD0624 – Addition of DataStore for Storing and Setting Configuration Options

This TD has been applied to this evaluation.

TD0628 – Addition of Container Image to Package Format

This TD has been applied to this evaluation.

TD0650 – Conformance claim sections updated to allow for MOD_VPNC_V2.3 and 2.4

N/A – the ST does not claim conformance to MOD_VPNC_V2.4.

TD0664 – Testing activity for FPT_TUD_EXT.2.2

This TD has been applied to this evaluation.

TD0669 – FIA_X509_EXT.1 Test 4 Interpretation

N/A – the TOE does not claim this SFR.

TD0717 – Format changes for PP_APP_V1.4

This TD has been applied to this evaluation.

TD0719 – ECD for PP APP V1.3 and 1.4

This TD has been applied to this evaluation.

TD0736 – Number of elements for iterations of FCS_HTTPS_EXT.1

N/A – the TOE does not claim this SFR.

TD0743 – FTP_DIT_EXT.1.1 Selection exclusivity

This TD has been applied to this evaluation.

TD0756 – Update for platform-provided full disk encryption

This TD has been applied to this evaluation.

1.2 References

[ST] Veeam Backup & Replication v12 Security Target, Version 1.6, 9 July 2023

[CCECG] Veeam Backup and Replication v12 Common Criteria Evaluated Configuration Guide (CCECG), Version 1.0, 9 July 2023.

1.3 SAR Evaluation

The following Security Assurance Requirements (SARs) were evaluated during the evaluation of the TOE:

SAR	Verdict
ASE_CCL.1	Pass
ASE_ECD.1	Pass
ASE_INT.1	Pass
ASE_OBJ.1	Pass
ASE_REQ.1	Pass
ASE_TSS.1	Pass
ADV_FSP.1	Pass
AGD_OPE.1	Pass
AGD_PRE.1	Pass
ALC_CMC.1	Pass
ALC_CMS.1	Pass
ALC_TSU_EXT.1	Pass
ATE_IND.1	Pass
AVA_VAN.1	Pass

The evaluation work units are listed in the proprietary ETR. The evaluators note per the PP evaluation activities that many of the SARs were successfully evaluated through completion of the associated evaluation activities presented in the claimed PP.

2. Security Functional Requirement Evaluation Activities

This section describes the evaluation activities associated with the SFRs defined in the ST and the results of those activities as performed by the evaluation team. The evaluation activities are derived from [PP_APP_v1.4]. NIAP Technical Decisions have been applied and are identified as appropriate.

2.1 Cryptographic Support (FCS)

2.1.1 Cryptographic Key Generation Services (FCS_CKM_EXT.1)

2.1.1.1 TSS Activities

The evaluator shall inspect the application and its developer documentation to determine if the application needs asymmetric key generation services. If not, the evaluator shall verify the ***generate no asymmetric cryptographic keys*** selection is present in the ST. Otherwise, the evaluation activities shall be performed as stated in the selection-based requirements.

The evaluator inspected the application and its documentation, comprising [CCECG], and determined the TOE does not need asymmetric key generation services. As such, the evaluator verified the ST selects "generate no asymmetric cryptographic keys" in FCS_CKM_EXT.1.

2.1.1.2 Guidance Activities

None.

2.1.1.3 Test Activities

None.

2.1.2 Random Bit Generation Services (FCS_RBG_EXT.1)

2.1.2.1 TSS Activities

If "*use no DRBG functionality"* is selected, the evaluator shall inspect the application and its developer documentation and verify that the application needs no random bit generation services.

If "*implement DRBG functionality"* is selected, the evaluator shall ensure that additional FCS_RBG_EXT.2 elements are included in the ST.

If "*invoke platform-provided DRBG functionality"* is selected, the evaluator performs the following activities. The evaluator shall examine the TSS to confirm that it identifies all functions (as described by the SFRs included in the ST) that obtain random numbers from the platform RBG. The evaluator shall determine that for each of these functions, the TSS states which platform interface (API) is used to obtain the random numbers. The evaluator shall confirm that each of these interfaces corresponds to the acceptable interfaces listed for each platform below.

It should be noted that there is no expectation that the evaluators attempt to confirm that the APIs are being used correctly for the functions identified in the TSS; the activity is to list the used APIs and then do an existence check via decompilation.

In FCS_RBG_EXT.1.1, the ST author has selected ***use no DRBG functionality***. The evaluator examined the application and its documentation, comprising [CCECG], and confirmed the application does not need random bit generation services.

2.1.2.2 Guidance Activities

None defined.

2.1.2.3 Test Activities

If "*invoke platform-provided DRBG functionality*" is selected, the following tests shall be performed:

The evaluator shall decompile the application binary using a decompiler suitable for the application (TOE). The evaluator shall search the output of the decompiler to determine that, for each API listed in the TSS, that API appears in the output. If the representation of the API does not correspond directly to the strings in the following list, the evaluator shall provide a mapping from the decompiled text to its corresponding API, with a description of why the API text does not directly correspond to the decompiled text and justification that the decompiled text corresponds to the associated API.

The following are the per-platform list of acceptable APIs:

Platforms: Microsoft Windows…

The evaluator shall verify that rand_s, RtlGenRandom, BCryptGenRandom, or CryptGenRandom API is used for classic desktop applications. The evaluator shall verify the application uses the RNGCryptoServiceProvider class or derives a class from System.Security.Cryptography.RandomNumberGenerator API for Windows Universal Applications. It is only required that the API is called/invoked, there is no requirement that the API be used directly. In future versions of this document, CryptGenRandom may be removed as an option as it is no longer the preferred API per vendor documentation.

In FCS_RBG_EXT.1.1, the ST author has selected ***use no DRBG functionality***. Therefore, this activity is not applicable to the TOE.

2.1.3 Storage of Credentials (FCS_STO_EXT.1)

2.1.3.1 TSS Activities

The evaluator shall check the TSS to ensure that it lists all persistent credentials (secret keys, PKI private keys, or passwords) needed to meet the requirements in the ST. For each of these items, the evaluator shall confirm that the TSS lists for what purpose it is used, and how it is stored.

Section 6.2.3 of [ST] ("Storage of Credentials (FCS_STO_EXT.1)") states the TOE does not store any credentials. This is consistent with the selection in FCS_STO_EXT.1.1 of "Not store any credentials".

2.1.3.2 Guidance Activities

None defined.

2.1.3.3 Test Activities

For all credentials for which the application implements functionality, the evaluator shall verify credentials are encrypted according to FCS_COP.1/SKC or conditioned according to FCS_CKM.1.1/AK and FCS_CKM.1/PBKDF. For all credentials for which the application invokes platform-provided functionality, the evaluator shall perform the following actions which vary per platform.

Platforms: Microsoft Windows…

The evaluator shall verify that all certificates are stored in the Windows Certificate Store. The evaluator shall verify that other credentials, like passwords, are stored in the Windows Credential Manager or stored using the Data Protection API (DPAPI). For Windows Universal Applications, the evaluator shall verify that the application is using the ProtectData class and storing credentials in IsolatedStorage.

The TOE does not store any credentials. Therefore, this Test activity is not applicable.

2.2 User Data Protection (FDP)

2.2.1 Encryption of Sensitive Application Data (FDP_DAR_EXT.1)

2.2.1.1 TSS Activities

The evaluator shall examine the TSS to ensure that it describes the sensitive data processed by the application. The evaluator shall then ensure that the following activities cover all of the sensitive data identified in the TSS.

Section 6.2 of [ST] ("Cryptographic Support") states the TOE invokes platform-provided cryptographic functionality for the following purposes:

- Encrypting VBR configuration data, job data, and session data in the VBR Configuration Database (PostgreSQL), using platform-provided DPAPI
- Encrypting backup files, backup copies, and file metadata in the VBR Backup Repository, using platform-provided BitLocker.

If ***not store any sensitive data*** is selected, the evaluator shall inspect the TSS to ensure that it describes how sensitive data cannot be written to non-volatile memory. The evaluator shall also ensure that this is consistent with the filesystem test below.

The ST does not select "not store any sensitive data", so this activity is not applicable.

2.2.1.2 Guidance Activities

None defined.

2.2.1.3 Test Activities

Modified in accordance with TD0756.

Evaluation activities (after the identification of the sensitive data) are to be performed on all sensitive data listed that are not covered by FCS_STO_EXT.1.

If "implement functionality to encrypt sensitive data as defined in the PP-Module for File Encryption" or "protect sensitive data in accordance with FCS_STO_EXT.1" is selected, the evaluator shall inventory the filesystem locations where the application may write data. The evaluator shall run the application and attempt to store sensitive data. The evaluator shall then inspect those areas of the filesystem to note where data was stored (if any), and determine whether it has been encrypted.

The ST does not select either "implement functionality to encrypt sensitive data as defined in the PP-Module for File Encryption" or "protect sensitive data in accordance with FCS_STO_EXT.1". Therefore, this activity is not applicable to the TOE.

If “leverage platform-provided functionality” is selected, the evaluation activities will be performed as stated in the following requirements, which vary on a per-platform basis:

Platforms: Microsoft Windows…

The Windows platform currently does not provide data-at-rest encryption services which depend upon invocation by application developers. The evaluator shall verify that the Operational User Guidance makes the need to activate platform encryption, such as BitLocker or Encrypting File System (EFS), clear to the end user.

Section 5.2.2.1 of [ST] (“FDP_DAR_EXT.1 Encryption of Sensitive Application Data”) specifies FDP_DAR_EXT.1 and selects “leverage platform-provided functionality to encrypt sensitive data”.

Section “Software Download, Installation and Configuration”, subsection “Prerequisite” of [CCECG] states the administrator must activate platform-provided BitLocker before installing the TOE.

2.2.2 Access to Platform Resources (FDP_DEC_EXT.1)

2.2.2.1 FDP_DEC_EXT.1.1

2.2.2.1.1 TSS Activities

None defined.

2.2.2.1.2 Guidance Activities

The evaluator shall perform the platform-specific actions below and inspect user documentation to determine the application's access to hardware resources. The evaluator shall ensure that this is consistent with the selections indicated. The evaluator shall review documentation provided by the application developer and for each resource which it accesses, identify the justification as to why access is required.

The statement of FDP_DEC_EXT.1.1 in Section 5.2.2.2 of [ST] (“FDP_DEC_EXT.1 Access to Platform Resources”) selects “no hardware resources”. Furthermore, section “Software Download, Installation and Configuration”, subsection “Access to Platform Resources” in [CCECG] states “The TOE does not access any hardware resources”.

2.2.2.1.3 Test Activities

Platforms: Microsoft Windows…

For Windows Universal Applications the evaluator shall check the WMAppManifest.xml file for a list of required hardware capabilities. The evaluator shall verify that the user is made aware of the required hardware capabilities when the application is first installed. This includes permissions such as ID_CAP_ISV_CAMERA, ID_CAP_LOCATION, ID_CAP_NETWORKING, ID_CAP_MICROPHONE, ID_CAP_PROXIMITY and so on. A complete list of Windows App permissions can be found at:

- http://msdn.microsoft.com/en-US/library/windows/apps/jj206936.aspx

For Windows Desktop Applications the evaluator shall identify in either the application software or its documentation the list of the required hardware resources.

The evaluator examined the TOE’s documentation and verified that it does not use any platform hardware resources.

2.2.2.2 FDP_DEC_EXT.1.2

2.2.2.2.1 TSS Activities

None defined.

2.2.2.2.2 Guidance Activities

The evaluator shall perform the platform-specific actions below and inspect user documentation to determine the application's access to sensitive information repositories. The evaluator shall ensure that this is consistent with the selections indicated. The evaluator shall review documentation provided by the application developer and for each sensitive information repository which it accesses, identify the justification as to why access is required.

The statement of FDP_DEC_EXT.1.2 in Section 5.2.2.2 of [ST] ("FDP_DEC_EXT.1 Access to Platform Resources") selects the assignment "list of additional sensitive information repositories", which it completes with the following: backup data; job data; and session data (event logs). Furthermore, section "Software Download, Installation and Configuration", subsection "Access to Platform Resources" in [CCECG] states "The application restricts access to VBR event logs, VBR job information, and VBR infrastructure information".

2.2.2.2.3 Test Activities

Platforms: Microsoft Windows… For Windows Universal Applications the evaluator shall check the WMAppManifest.xml file for a list of required capabilities. The evaluator shall identify the required information repositories when the application is first installed. This includes permissions such as ID_CAP_CONTACTS, ID_CAP_APPOINTMENTS, ID_CAP_MEDIALIB and so on. A complete list of Windows App permissions can be found at: • http://msdn.microsoft.com/en-US/library/windows/apps/jj206936.aspx For Windows Desktop Applications the evaluator shall identify in either the application software or its documentation the list of sensitive information repositories it accesses.

The evaluator verified that the TOE's documentation states that the TOE restricts its access to VBR event logs, VBR job information and VBR infrastructure information.

2.2.3 Network Communications (FDP_NET_EXT.1)

2.2.3.1 TSS Activities

None defined.

2.2.3.2 Guidance Activities

None defined.

2.2.3.3 Test Activities

The evaluator shall perform the following tests: **Test 1**: The evaluator shall run the application. While the application is running, the evaluator shall sniff network traffic ignoring all non-application associated traffic and verify that any network communications witnessed are documented in the TSS or are user-initiated.

The evaluator verified that the TOE does not generate any network traffic as claimed in the [ST].

Test 2: The evaluator shall run the application. After the application initializes, the evaluator shall run network port scans to verify that any ports opened by the application have been captured in the ST for the third selection and its assignment. This includes connection-based protocols (e.g. TCP, DCCP) as well as connectionless protocols (e.g. UDP).

A port scan of the TOE showed that all open ports were opened by the platform OS and not the TOE itself.

2.3 Security Management (FMT)

2.3.1 Secure by Default Configuration (FMT_CFG_EXT.1)

2.3.1.1 FMT_CFG_EXT.1.1

2.3.1.1.1 TSS Activities

The evaluator shall check the TSS to determine if the application requires any type of credentials and if the application installs with default credentials.

Section 6.4.1 of [ST] ("Secure by Default Configuration (FMT_CFG_EXT.1)") states users access the TOE by first logging onto the Windows server hosting the TOE. The TOE is installed under an admin account or server account with appropriate permissions. It does not install with default credentials.

2.3.1.1.2 Guidance Activities

None.

2.3.1.1.3 Test Activities

If the application uses any default credentials the evaluator shall run the following tests. **Test 1**: The evaluator shall install and run the application without generating or loading new credentials and verify that only the minimal application functionality required to set new credentials is available. **Test 2**: The evaluator shall attempt to clear all credentials and verify that only the minimal application functionality required to set new credentials is available. **Test 3**: The evaluator shall run the application, establish new credentials and verify that the original default credentials no longer provide access to the application.

The TOE does not use any default credentials. As such, these tests are not applicable.

2.3.1.2 FMT_CFG_EXT.1.2

2.3.1.2.1 TSS Activities

None.

2.3.1.2.2 Guidance Activities

None.

2.3.1.2.3 Test Activities

The evaluator shall install and run the application. The evaluator shall inspect the filesystem of the platform (to the extent possible) for any files created by the application and ensure that their permissions are adequate to protect them. The method of doing so varies per platform.

Platforms: Microsoft Windows…

The evaluator shall run the SysInternals tools, Process Monitor and Access Check (or tools of equivalent capability, like icacls.exe) for Classic Desktop applications to verify that files written to disk during an application's installation have the correct file permissions, such that a standard user cannot modify the application or its data files. For Windows Universal Applications the evaluator shall consider the requirement met because of the AppContainer sandbox.

The evaluator examined the TOE's data files and verified that standard user accounts only have read access to them.

2.3.2 Supported Configuration Mechanism (FMT_MEC_EXT.1)

2.3.2.1 TSS Activities

The evaluator shall review the TSS to identify the application's configuration options (e.g. settings) and determine whether these are stored and set using the mechanisms supported by the platform or implemented by the application in accordance with the PP-Module for File Encryption. At a minimum the TSS shall list settings related to any SFRs and any settings that are mandated in the operational guidance in response to an SFR.

Section 6.4.2 of [ST] ("Supported Configuration Mechanism (FMT_MEC_EXT.1)") states the TOE stores its configuration settings, comprising information about the PostgreSQL database (location, basic listening ports, license information, and logging options) in the Windows Registry.

Conditional: If "implement functionality to encrypt and store configuration options as defined by FDP_PRT_EXT.1 in the PP-Module for File Encryption" is selected, the evaluator shall ensure that the TSS identifies those options, as well as indicates where the encrypted representation of these options is stored.

The ST does not make this selection.

2.3.2.2 Guidance Activities

None.

2.3.2.3 Test Activities

If “invoke the mechanisms recommended by the platform vendor for storing and setting configuration options” is chosen, the method of testing varies per platform as follows:

Platforms: Microsoft Windows…

The evaluator shall determine and verify that Windows Universal Applications use either the Windows.Storage namespace, Windows.UI.ApplicationSettings namespace, or the IsolatedStorageSettings namespace for storing application specific settings. For .NET applications, the evaluator shall determine and verify that the application uses one of the locations listed in https://docs.microsoft.com/en-us/dotnet/framework/configure-apps/ for storing application specific settings. For Classic Desktop applications, the evaluator shall run the application while monitoring it with the SysInternals tool ProcMon and make changes to its configuration. The evaluator shall verify that ProcMon logs show corresponding changes to the the Windows Registry or C:\ProgramData\ directory.

The evaluator used ProcMon to verify that TOE configuration changes are written to the Windows Registry.

If “implement functionality to encrypt and store configuration options as defined by FDP_PRT_EXT.1 in the PP-Module for File Encryption” is selected, for all configuration options listed in the TSS as being stored and protected using encryption, the evaluator shall examine the contents of the configuration option storage (identified in the TSS) to determine that the options have been encrypted.

The ST does not make this selection.

2.3.3 Specification of Management Functions (FMT_SMF.1)

2.3.3.1 TSS Activities

None.

2.3.3.2 Guidance Activities

The evaluator shall verify that every management function mandated by the PP is described in the operational guidance and that the description contains the information required to perform the management duties associated with the management function.

As described in Section 6.4.3 of [ST] (“Specification of Management Functions (FMT_SMF.1)”), the TOE supports the following security-relevant management function: backup and restore the configuration database.

Section “Software Download, Installation and Configuration”, subsection “Management” of [CCECG] describes how the administrator backs up and restores the configuration database.

2.3.3.3 Test Activities

The evaluator shall test the application's ability to provide the management functions by configuring the application and testing each option selected from above. The evaluator is expected to test these functions in all the ways in which the ST and guidance documentation state the configuration can be managed.

The evaluator verified the TOE’s ability to backup and restore the configuration database as claimed in the [ST].

2.4 Privacy (FPR)

2.4.1 User Consent for Transmission of Personally Identifiable Information (FPR_ANO_EXT.1)

2.4.1.1 TSS Activities

The evaluator shall inspect the TSS documentation to identify functionality in the application where PII can be transmitted.

Section 6.5 of [ST] ("Privacy") states the TOE does not transmit PII over the network.

2.4.1.2 Guidance Activities

None.

2.4.1.3 Test Activities

If ***require user approval before executing*** is selected, the evaluator shall run the application and exercise the functionality responsible for transmitting PII and verify that user approval is required before transmission of the PII.

The ST does not make this selection.

2.5 Protection of the TSF (FPT)

2.5.1 Anti-Exploitation Capabilities (FPT_AEX_EXT.1)

2.5.1.1 FPT_AEX_EXT.1.1

2.5.1.1.1 TSS Activities

The evaluator shall ensure that the TSS describes the compiler flags used to enable ASLR when the application is compiled.

Section 6.6.1 of [ST] ("Anti-Exploitation Capabilities (FPT_AEX_EXT.1)") states the `/DYNAMICBASE` link option is used to enable ASLR.

2.5.1.1.2 Guidance Activities

None.

2.5.1.1.3 Test Activities

The evaluator shall perform either a static or dynamic analysis to determine that no memory mappings are placed at an explicit and consistent address. The method of doing so varies per platform. For those platforms requiring the same application running on two different systems, the evaluator may alternatively use the same device. After collecting the first instance of mappings, the evaluator must uninstall the application, reboot the device, and reinstall the application to collect the second instance of mappings.

Platforms: Microsoft Windows…

The evaluator shall run the same application on two different Windows systems and run a tool that will list all memory mapped addresses for the application. The evaluator shall then verify the two different instances share no mapping locations. The Microsoft SysInternals tool, VMMap, could be used to view memory addresses of a running application. The evaluator shall use a tool such as Microsoft's BinScope Binary Analyzer to confirm that the application has ASLR enabled.

The evaluator used VMMmap to verify that two instances of the TOE do not map memory to the same locations.

2.5.1.2 FPT_AEX_EXT.1.2

2.5.1.2.1 TSS Activities

None.

2.5.1.2.2 Guidance Activities

None.

2.5.1.2.3 Test Activities

The evaluator shall verify that no memory mapping requests are made with write and execute permissions. The method of doing so varies per platform.

Platforms: Microsoft Windows…

The evaluator shall use a tool such as Microsoft's BinScope Binary Analyzer to confirm that the application passes the NXCheck. The evaluator may also ensure that the /NXCOMPAT flag was used during compilation to verify that DEP protections are enabled for the application.

The evaluator used BinScope to verify that the TOE passes NXCheck.

2.5.1.3 FPT_AEX_EXT.1.3

2.5.1.3.1 TSS Activities

None.

2.5.1.3.2 Guidance Activities

None.

2.5.1.3.3 Test Activities

The evaluator shall configure the platform in the ascribed manner and carry out one of the prescribed tests:

Platforms: Microsoft Windows…

If the OS platform supports Windows Defender Exploit Guard (Windows 10 version 1709 or later), then the evaluator shall ensure that the application can run successfully with Windows Defender Exploit Guard Exploit Protection configured with the following minimum mitigations enabled; Control Flow Guard (CFG), Randomize memory allocations (Bottom-Up ASLR), Export address filtering (EAF), Import address filtering (IAF), and Data Execution Prevention (DEP). The following link describes how to enable Exploit Protection, https://docs.microsoft.com/en-us/windows/security/threat-protection/windows-defender-exploit-guard/customize-exploit-protection.

If the OS platform supports the Enhanced Mitigation Experience Toolkit (EMET) which can be installed on Windows 10 version 1703 and earlier, then the evaluator shall ensure that the application can run successfully with EMET configured with the following minimum mitigations enabled; Memory Protection Check, Randomize memory allocations (Bottom-Up ASLR), Export address filtering (EAF), and Data Execution Prevention (DEP).

The evaluator verified that the TOE could be run without disabling any platform security features.

2.5.1.4 FPT_AEX_EXT.1.4

2.5.1.4.1 TSS Activities

None.

2.5.1.4.2 Guidance Activities

None.

2.5.1.4.3 Test Activities

The evaluator shall run the application and determine where it writes its files. For files where the user does not choose the destination, the evaluator shall check whether the destination directory contains executable files. This varies per platform:

Platforms: Microsoft Windows…

For Windows Universal Applications the evaluator shall consider the requirement met because the platform forces applications to write all data within the application working directory (sandbox). For Windows Desktop Applications the evaluator shall run the program, mimicking normal usage, and note where all user-modifiable files are written. The evaluator shall ensure that there are no executable files stored in the same directories to which the application wrote user-modifiable files.

The evaluator verified that the TOE does not write user-modifiable files to directories which contain executable files.

2.5.1.5 FPT_AEX_EXT.1.5

2.5.1.5.1 TSS Activities

None.

2.5.1.5.2 Guidance Activities

None.

2.5.1.5.3 Test Activities

The evaluator will inspect every native executable included in the TOE to ensure that stack-based buffer overflow protection is present.

Platforms: Microsoft Windows…

Applications that run as Managed Code in the .NET Framework do not require these stack protections. Applications developed in Object Pascal using the Delphi IDE compiled with RangeChecking enabled comply with this element. For other code, the evaluator shall review the TSS and verify that the /GS flag was used during compilation. The evaluator shall run a tool like, BinScope, that can verify the correct usage of /GS.

The evaluator used BinScope to verify that the TOE passes GSCheck.

2.5.2 Use of Supported Services and APIs (FPT_API_EXT.1)

2.5.2.1 TSS Activities

The evaluator shall verify that the TSS lists the platform APIs used in the application.

Section 6.6.2 of [ST] ("Use of Supported Services and APIs (FPT_API_EXT.1)") states the TOE invokes the Microsoft products identified in Appendix A. In Appendix A of [ST] ("TOE Usage of Third-Party Libraries"), Table 8 ("Supported Services and APIs") lists the platform-provided services and APIs used in the application.

2.5.2.2 Guidance Activities

None.

2.5.2.3 Test Activities

The evaluator shall then compare the list with the supported APIs (available through e.g. developer accounts, platform developer groups) and ensure that all APIs listed in the TSS are supported.

The evaluator verified that all of the TOE's listed APIs are properly documented.

2.5.3 Use of Third Party Libraries (FPT_LIB_EXT.1)

2.5.3.1 TSS Activities

None.

2.5.3.2 Guidance Activities

None.

2.5.3.3 Test Activities

The evaluator shall install the application and survey its installation directory for dynamic libraries. The evaluator shall verify that libraries found to be packaged with or employed by the application are limited to those in the assignment.

The evaluator verified that the TOE does not have any undocumented libraries.

2.5.4 Software Identification and Versions (FPT_IDV_EXT.1)

2.5.4.1 TSS Activities

If "other version information" is selected the evaluator shall verify that the TSS contains an explanation of the versioning methodology.

Section 5.2.5.3 of [ST] ("FPT_IDV_EXT.1 Software Identification and Versions") selects "other version information" in FPT_IDV_EXT.1.1 and completes the assignment with "a Major, Minor and Build Number". Section 6.6.3 of [ST] ("Software Identification and Versions (FPT_IDV_EXT.1)") explains the TOE versioning methodology. The TOE uses the version format Major.0.Minor.Build PYYYYMMDD, where 'Major' is the major release with a number of significant features, '0' is not used, 'Minor' is the minor release, usually centered around support for new platforms and bug fixes, and 'Build' is the build number, which starts at 1 and has no upper bound within the given Major version. The string 'PYYYYMMDD' denotes cumulative hotfix rollups, labelled with the date on which the package was built.

2.5.4.2 Guidance Activities

None.

2.5.4.3 Test Activities

The evaluator shall install the application, then check for the existence of version information. If SWID tags is selected the evaluator shall check for a .swidtag file. The evaluator shall open the file and verify that is contains at least a SoftwareIdentity element and an Entity element.

The TOE does not use SWID tags. The evaluator verified that it uses a major.0.minor.build versioning system.

2.5.5 Integrity for Installation and Update (FPT_TUD_EXT.1)

2.5.5.1 FPT_TUD_EXT.1.1

2.5.5.1.1 TSS Activities

None.

2.5.5.1.2 Guidance Activities

The evaluator shall check to ensure the guidance includes a description of how updates are performed.

Section "Software Download, Installation and Configuration", subsection "Trusted Update" of [CCECG] describes how the administrator performs updates of the TOE.

2.5.5.1.3 Test Activities

The evaluator shall check for an update using procedures described in either the application documentation or the platform documentation and verify that the application does not issue an error. If it is updated or if it reports that no update is available this requirement is considered to be met.

The evaluator was able to check the TOE's version number and compare it to the most recent version on the vendor's website.

2.5.5.2 FPT_TUD_EXT.1.2

2.5.5.2.1 TSS Activities

None.

2.5.5.2.2 Guidance Activities

The evaluator shall verify guidance includes a description of how to query the current version of the application.

Section “Software Download, Installation and Configuration”, subsection “Trusted Update” of [CCECG] describes how the administrator can query the current version of the application.

2.5.5.2.3 Test Activities

The evaluator shall query the application for the current version of the software according to the operational user guidance. The evaluator shall then verify that the current version matches that of the documented and installed version.

The evaluator was able to query the TOE version and verified that it matched what it should be.

2.5.5.3 FPT_TUD_EXT.1.3

2.5.5.3.1 TSS Activities

None.

2.5.5.3.2 Guidance Activities

None.

2.5.5.3.3 Test Activities

The evaluator shall verify that the application's executable files are not changed by the application.

Platforms: Apple iOS…

The evaluator shall consider the requirement met because the platform forces applications to write all data within the application working directory (sandbox).

For all other platforms, the evaluator shall perform the following test:

Test 1: The evaluator shall install the application and then locate all of its executable files. The evaluator shall then, for each file, save off either a hash of the file or a copy of the file itself. The evaluator shall then run the application and exercise all features of the application as described in the ST. The evaluator shall then compare each executable file with the either the saved hash or the saved copy of the files. The evaluator shall verify that these are identical.

The evaluator verified that the TOE’s executable files are not modified by the TOE.

2.5.5.4 FPT_TUD_EXT.1.4

2.5.5.4.1 TSS Activities

The evaluator shall verify that the TSS identifies how updates to the application are signed by an authorized source. The definition of an authorized source must be contained in the TSS. The evaluator shall also ensure that the TSS (or the operational guidance) describes how candidate updates are obtained.

Section 6.6.5 of [ST] ("Trusted Update (FPT_TUD_EXT.1), Integrity for Installation and Update (FPT_TUD_EXT.2)") states the vendor signs TOE updates with the Veeam Software Group GmbH digital certificate.

Section "Software Download, Installation and Configuration", subsection "Trusted Update" of [CCECG] describes how the administrator obtains candidate updates for the TOE.

2.5.5.4.2 Guidance Activities

None.

2.5.5.4.3 Test Activities

None.

2.5.5.5 FPT_TUD_EXT.1.5

2.5.5.5.1 TSS Activities

The evaluator shall verify that the TSS identifies how the application is distributed. If "with the platform" is selected the evaluated shall perform a clean installation or factory reset to confirm that TOE software is included as part of the platform OS. If "as an additional package" is selected the evaluator shall perform the tests in FPT_TUD_EXT.2.

Section 6.6.5 of [ST] ("Trusted Update (FPT_TUD_EXT.1), Integrity for Installation and Update (FPT_TUD_EXT.2)") states the TOE is distributed and installed separately from Windows.

Section 5.2.5.5 of [ST] ("FPT_TUD_EXT.1 Integrity for Installation and Update") specifies the application is distributed "as an additional software package to the platform OS". Refer to Section 2.5.6 for evaluation activities associated with FPT_TUD_EXT.2.

2.5.5.5.2 Guidance Activities

None.

2.5.5.5.3 Test Activities

None.

2.5.6 Integrity for Installation and Update (FPT_TUD_EXT.2)

2.5.6.1 FPT_TUD_EXT.2.1

2.5.6.1.1 TSS Activities

None.

2.5.6.1.2 Guidance Activities

None.

2.5.6.1.3 Test Activities

The evaluator shall verify that application updates are distributed in the format supported by the platform. This varies per platform:

Platforms: Microsoft Windows…

The evaluator shall ensure that the application is packaged in the standard Windows Installer (.MSI) format, the Windows Application Software (.EXE) format signed using the Microsoft Authenticode process, or the Windows Universal Application package (.APPX) format. See https://msdn.microsoft.com/en-us/library/ms537364(v=vs.85).aspx for details regarding Authenticode signing.

The TOE's installer was verified to be a .EXE file.

2.5.6.2 FPT_TUD_EXT.2.2

2.5.6.2.1 TSS Activities

None.

2.5.6.2.2 Guidance Activities

None.

2.5.6.2.3 Test Activities

Modified by TD0664

Platforms: Microsoft Windows…

~~The evaluator shall install the application and then locate all of its executable files. The evaluator shall then, for each file, save off either a hash of the file or a copy of the file itself. The evaluator shall then run the application and exercise all features of the application as described in the ST. The evaluator shall then compare each executable file with the either the saved hash or the saved copy of the files. The evaluator shall verify that these are identical.~~

All Other Platforms...

The evaluator shall record the path of every file on the entire filesystem prior to installation of the application, and then install and run the application. Afterwards, the evaluator shall then uninstall the application, and compare the resulting filesystem to the initial record to verify that no files, other than configuration, output, and audit/log files, have been added to the filesystem.

The evaluator verified that the TOE uninstalls itself correctly and does not leave residual files other than configuration, output, and audit/log files.

2.5.6.3 FPT_TUD_EXT.2.3

2.5.6.3.1 TSS Activities

The evaluator shall verify that the TSS identifies how the application installation package is signed by an authorized source. The definition of an authorized source must be contained in the TSS.

Section 6.6.5 of [ST] ("Trusted Update (FPT_TUD_EXT.1), Integrity for Installation and Update (FPT_TUD_EXT.2)") states the vendor signs the TOE installation package with the Veeam Software Group GmbH digital certificate. DigiCert is the Certificate Authority for this certificate. The vendor signs the TOE code on the Veeam signing server during the build process.

2.5.6.3.2 Guidance Activities

None.

2.5.6.3.3 Test Activities

None.

2.6 Trusted Path/Channels (FTP)

2.6.1 Protection of Data in Transit (FTP_DIT_EXT.1)

2.6.1.1 TSS Activities

For platform-provided functionality, the evaluator shall verify the TSS contains the calls to the platform that TOE is leveraging to invoke the functionality.

Section 5.2.6.1 of [ST] ("FTP_DIT_EXT.1 Protection of Data in Transit") specifies the application shall not transmit any data between itself and another trusted IT product.

2.6.1.2 Guidance Activities

None.

2.6.1.3 Test Activities

The evaluator shall perform the following tests: **Test 1:** The evaluator shall exercise the application (attempting to transmit data; for example by connecting to remote systems or websites) while capturing packets from the application. The evaluator shall verify from the packet capture that the traffic is encrypted with HTTPS, TLS, DTLS, SSH, or IPsec in accordance with the selection in the ST.

As stated in the [ST] the TOE does not transmit any data.

Test 2: The evaluator shall exercise the application (attempting to transmit data; for example by connecting to remote systems or websites) while capturing packets from the application. The evaluator shall review the packet capture and verify that no sensitive data is transmitted in the clear.

As stated in the [ST] the TOE does not transmit any data.

Test 3: The evaluator shall inspect the TSS to determine if user credentials are transmitted. If credentials are transmitted the evaluator shall set the credential to a known value. The evaluator shall capture packets from the application while causing credentials to be transmitted as described in the TSS. The evaluator shall perform a string search of the captured network packets and verify that the plaintext credential previously set by the evaluator is not found.

As stated in the [ST] the TOE does not transmit any data.

3. Security Assurance Requirement Evaluation Activities

3.1 Class ASE: Security Target

As per ASE activities defined in [CEM].

The evaluation team performed the ASE work units as defined in [CEM] and assigned a Pass verdict to each work unit.

3.2 Class ADV: Development

The information about the TOE is contained in the guidance documentation available to the end user as well as the TSS portion of the ST. The TOE developer must concur with the description of the product that is contained in the TSS as it relates to the functional requirements. The evaluation activities contained in Section 5.1 Security Functional Requirements should provide the ST authors with sufficient information to determine the appropriate content for the TSS section.

3.2.1 Basic Functional Specification (ADV_FSP.1)

3.2.1.1 Evaluation Activities

There are no specific assurance activities associated with these SARs, except ensuring the information is provided. The functional specification documentation is provided to support the evaluation activities described in Section 5.1, and other activities described for AGD, ATE, and AVA SARs. The requirements on the content of the functional specification information is implicitly assessed by virtue of the other assurance activities being performed; if the evaluator is unable to perform an activity because there is insufficient interface information, then an adequate functional specification has not been provided.

The Evaluation Activities identified above provided sufficient information to determine the appropriate content for the TSS section and to perform the evaluation activities. Since these are directly associated with the SFRs, and are implicitly already done, no additional documentation or analysis is necessary.

3.3 Class AGD: Guidance Documents

The guidance documents will be provided with the ST. Guidance must include a description of how the IT personnel verifies that the Operational Environment can fulfill its role for the security functionality. The documentation should be in an informal style and readable by the IT personnel. Guidance must be provided for every operational environment that the product supports as claimed in the ST. This guidance includes instructions to successfully install the TSF in that environment; and Instructions to manage the security of the TSF as a product and as a component of the larger operational environment. Guidance pertaining to particular security functionality is also provided; requirements on such guidance are contained in the evaluation activities specified with each requirement.

3.3.1 Operational User Guidance (AGD_OPE.1)

3.3.1.1 Evaluation Activities

Some of the contents of the operational guidance will be verified by the assurance activities in Section 5.1 and evaluation of the TOE according to the [CEM]. The following additional information is also required.

If cryptographic functions are provided by the TOE, the operational guidance shall contain instructions for configuring the cryptographic engine associated with the evaluated configuration of the TOE. It shall provide a warning to the administrator that use of other cryptographic engines was not evaluated nor tested during the CC evaluation of the TOE.

The documentation must describe the process for verifying updates to the TOE by verifying a digital signature – this may be done by the TOE or the underlying platform.

The evaluator shall verify that this process includes the following steps:

- Instructions for obtaining the update itself. This should include instructions for making the update accessible to the TOE (e.g., placement in a specific directory).
- Instructions for initiating the update process, as well as discerning whether the process was successful or unsuccessful. This includes generation of the digital signature. The TOE will likely contain security functionality that does not fall in the scope of evaluation under this PP. The operational guidance shall make it clear to an administrator which security functionality is covered by the evaluation activities.

The TOE does not implement cryptographic functions. Instead, it leverages platform-provided cryptography (specifically, DPAPI and BitLocker) to protect sensitive data at rest.

The guidance provided by [CCECG] includes a description of how the administrator performs updates of the TOE. The description covers how to obtain the update and make it accessible to the TOE and how to initiate the update process. Refer to section “Software Download, Installation and Configuration”, subsection “Trusted Update” of [CCECG]. The administrator can discern the success or otherwise of an upgrade attempt by viewing the running TOE version using the “Help > About” function in the administrator UI.

Section “Logical Boundaries” of [CCECG] describes the security functionality of the TOE that falls within the scope of evaluation, while section “Functionality Excluded From the Evaluation Configuration” lists specific TOE functionality not covered by the evaluation.

3.3.2 Preparative Procedures (AGD_PRE.1)

3.3.2.1 Evaluation Activities

As indicated in the introduction above, there are significant expectations with respect to the documentation—especially when configuring the operational environment to support TOE functional requirements. The evaluator shall check to ensure that the guidance provided for the TOE adequately addresses all platforms claimed for the TOE in the ST.

The TOE in its evaluated configuration is supported on a single platform that is adequately addressed in the guidance documentation. Section “TOE Overview”, subsection “Physical Boundaries” of [CCECG] states the TOE is installed on a single instance of Microsoft Windows Server 2019.

3.4 Class ALC: Life-Cycle Support

At the assurance level provided for TOEs conformant to this PP, life-cycle support is limited to end-uservisible aspects of the life-cycle, rather than an examination of the TOE vendor’s development and configuration management process. This is not meant to diminish the critical role that a developer’s practices play in contributing to the overall trustworthiness of a product; rather, it is a reflection on the information to be made available for evaluation at this assurance level.

3.4.1 Labeling of the TOE (ALC_CMC.1)

3.4.1.1 Evaluation Activities

The evaluator shall check the ST to ensure that it contains an identifier (such as a product name/version number) that specifically identifies the version that meets the requirements of the ST. Further, the evaluator shall check the AGD guidance and TOE samples received for testing to ensure that the version number is consistent with that in the ST. If the vendor maintains a web site advertising the TOE, the evaluator shall examine the information on the web site to ensure that the information in the ST is sufficient to distinguish the product.

Section 1.1 of [ST] ("Security Target, Target of Evaluation, and Common Criteria Identification") includes the TOE identification. The ST identifies the TOE in terms of the software included in the evaluated configuration. This consists of Veeam Backup & Replication v12. This is consistent with the version number of the TOE identified in [CCECG] and the version identified by the TOE sample received for testing.

3.4.2 TOE Coverage (ALC_CMS.1)

3.4.2.1 Evaluation Activities

The "evaluation evidence required by the SARs" in this PP is limited to the information in the ST coupled with the guidance provided to administrators and users under the AGD requirements. By ensuring that the TOE is specifically identified and that this identification is consistent in the ST and in the AGD guidance (as done in the assurance activity for ALC_CMC.1), the evaluator implicitly confirms the information required by this component. Life-cycle support is targeted aspects of the developer's life-cycle and instructions to providers of applications for the developer's devices, rather than an in-depth examination of the TSF manufacturer's development and configuration management process. This is not meant to diminish the critical role that a developer's practices play in contributing to the overall trustworthiness of a product; rather, it's a reflection on the information to be made available for evaluation.

The evaluator shall ensure that the developer has identified (in guidance documentation for application developers concerning the targeted platform) one or more development environments appropriate for use in developing applications for the developer's platform. For each of these development environments, the developer shall provide information on how to configure the environment to ensure that buffer overflow protection mechanisms in the environment(s) are invoked (e.g., compiler flags). The evaluator shall ensure that this documentation also includes an indication of whether such protections are on by default, or have to be specifically enabled. The evaluator shall ensure that the TSF is uniquely identified (with respect to other products from the TSF vendor), and that documentation provided by the developer in association with the requirements in the ST is associated with the TSF using this unique identification.

As described in Section 3.4.1 above, the evaluator confirmed the TOE is labelled with unique software version identifiers. Section 6.6 of [ST] ("Protection of the TSF") describes how the TOE uses security features and APIs provided by the Windows platform. This includes data execution protection, Windows Defender Exploit Guard, and stack-based buffer overflow protection.

3.4.3 Timely Security Update (ALC_TSU_EXT.1)

This component requires the TOE developer, in conjunction with any other necessary parties, to provide information as to how the end-user devices are updated to address security issues in a timely manner. The documentation describes the process of providing updates to the public from the time a security flaw is reported/discovered, to the time an update is released. This description includes the parties involved (e.g., the developer, carriers(s)) and the steps that are performed (e.g., developer testing, carrier testing), including worst case time periods, before an update is made available to the public.

3.4.3.1 Evaluation Activities

The evaluator shall verify that the TSS contains a description of the timely security update process used by the developer to create and deploy security updates. The evaluator shall verify that this description addresses the entire application. The evaluator shall also verify that, in addition to the TOE developer's process, any third-party processes are also addressed in the description. The evaluator shall also verify that each mechanism for deployment of security updates is described.

The evaluator shall verify that, for each deployment mechanism described for the update process, the TSS lists a time between public disclosure of a vulnerability and public availability of the security update to the TOE patching this vulnerability, to include any third-party or carrier delays in deployment. The evaluator shall verify that this time is expressed in a number or range of days.

The evaluator shall verify that this description includes the publicly available mechanisms (including either an email address or website) for reporting security issues related to the TOE. The evaluator shall verify that the description of this mechanism includes a method for protecting the report either using a public key for encrypting email or a trusted channel for a website.

Section 6.1 of [ST] ("Timely Security Updates") describes the timely security update process used by the developer. The description encompasses the entirety of the TOE.

Users may submit security issues to Veeam via https://www.veeam.com/vulnerability-disclosure.html?ad=in-text-link. Availability of updates is announced via email sent to customers as well as via the Veeam website. Updates are provided within 60 days of public disclosure of vulnerabilities, including those for third-party components.

Section 6.5.5 of [ST] ("Trusted Update (FPT_TUD_EXT.1), Integrity for Installation and Update (FPT_TUD_EXT.2)") states TOE updates are packaged in .iso format and digitally signed with an RSA 2048-bit key using Microsoft Authenticode.

3.5 Class ATE: Tests

Testing is specified for functional aspects of the system as well as aspects that take advantage of design or implementation weaknesses. The former is done through the ATE_IND family, while the latter is through the AVA_VAN family. At the assurance level specified in this PP, testing is based on advertised functionality and interfaces with dependency on the availability of design information. One of the primary outputs of the evaluation process is the test report as specified in the following requirements.

3.5.1 Independent Testing – Conformance (ATE_IND.1)

3.5.1.1 Evaluation Activities

The evaluator shall prepare a test plan and report documenting the testing aspects of the system, including any application crashes during testing. The evaluator shall determine the root cause of any application crashes and include that information in the report. The test plan covers all of the testing actions contained in the [CEM] and the body of this PP's evaluation activities.

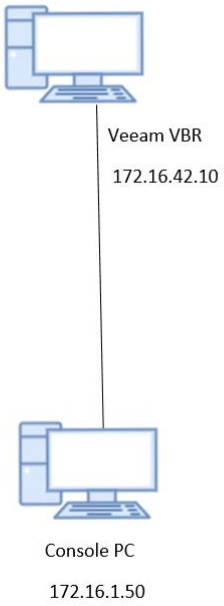
While it is not necessary to have one test case per test listed in an evaluation activity, the evaluator must document in the test plan that each applicable testing requirement in the ST is covered. The test plan identifies the platforms to be tested, and for those platforms not included in the test plan but included in the ST, the test plan provides a justification for not testing the platforms. This justification must address the differences between the tested platforms and the untested platforms, and make an argument that the differences do not affect the testing to be performed. It is not sufficient to merely assert that the differences have no affect; rationale must be provided. If all platforms claimed in the ST are tested, then no rationale is necessary. The test plan describes the composition of each platform to be tested, and any setup that is necessary beyond what is contained in the AGD documentation. It should be noted that the evaluator is expected to follow the AGD documentation for installation and setup of each platform either as part of a test or as a standard pre-test condition. This may include special test drivers or tools. For each driver or tool, an argument (not just an assertion) should be provided that the driver or tool will not adversely affect the performance of the functionality by the TOE and its platform.

This also includes the configuration of the cryptographic engine to be used. The cryptographic algorithms implemented by this engine are those specified by this PP and used by the cryptographic protocols being evaluated (e.g., SSH). The test plan identifies high-level test objectives as well as the test procedures to be followed to achieve those objectives. These procedures include expected results.

The test report (which could just be an annotated version of the test plan) details the activities that took place when the test procedures were executed, and includes the actual results of the tests. This shall be a cumulative account, so if there was a test run that resulted in a failure; a fix installed; and then a successful re-run of the test, the report would show a "fail" and "pass" result (and the supporting details), and not just the "pass" result.

The TOE was tested at Leidos's Columbia, MD location from May 2023 to July 2023. The procedures and results of this testing are available in the DTR document.

The following figure identifies the devices used for testing the TOE and describes the test configuration.



The following components were used to create the test configurations:

TOE Hardware (Physical)

- CPU: Intel Xeon Gold 6126
- Operating System: Microsoft Windows Server 2019 Standard
- Storage: 2.0 TB HDD
- Software: Veeam Backup & Replication 12.0.0.1154

Lab Equipment

- Virtual machines
  - tlss.leidos.ate
    - Operating System: Ubuntu 18.04
    - Purpose: NMAP Scans, Packet Captures
- Physical machines
    - cctl-jump.leidos.ate
      - Operating System: Windows Server 2016
      - Purpose: Terminal Server to access test network from corporate network, Access to the TOE web interface
      - Software utilized: Chrome v112.0.5615.49.

3.6 Class AVA: Vulnerability Assessment

For the current generation of this protection profile, the evaluation lab is expected to survey open sources to discover what vulnerabilities have been discovered in these types of products. In most cases, these vulnerabilities will require sophistication beyond that of a basic attacker. Until penetration tools are created and uniformly distributed to the evaluation labs, the evaluator will not be expected to test for these vulnerabilities in the TOE. The labs will be expected to comment on the likelihood of these vulnerabilities given the documentation provided by the vendor. This information will be used in the development of penetration testing tools and for the development of future protection profiles.

3.6.1 Vulnerability Survey (AVA_VAN.1)

3.6.1.1 Evaluation Activities

The evaluator shall generate a report to document their findings with respect to this requirement. This report could physically be part of the overall test report mentioned in ATE_IND, or a separate document. The evaluator performs a search of public information to find vulnerabilities that have been found in similar applications with a particular focus on network protocols the application uses and document formats it parses.

The evaluator documents the sources consulted and the vulnerabilities found in the report.

For each vulnerability found, the evaluator either provides a rationale with respect to its non-applicability, or the evaluator formulates a test (using the guidelines provided in ATE_IND) to confirm the vulnerability, if suitable. Suitability is determined by assessing the attack vector needed to take advantage of the vulnerability. If exploiting the vulnerability requires expert skills and an electron microscope, for instance, then a test would not be suitable and an appropriate justification would be formulated.

For Windows, Linux, macOS and Solaris: The evaluator shall also run a virus scanner with the most current virus definitions against the application files and verify that no files are flagged as malicious.

The evaluation team performed a search of the CVE (Common Vulnerabilities and Exposures) database (https://cve.mitre.org/).

The evaluation team performed searches on 21 July 2023, using the following search terms:

- “veeam”
- “backup and replication”
- The identity of each of the third-party libraries listed in Appendix A, Table 9, of [ST].

No vulnerabilities were identified for the TOE.

The evaluator scanned the installer script using a corporate provided virus scan software (Microsoft Windows Defender) and verified that no virus signatures were detected.

The evaluation team determined that no residual vulnerabilities exist that are exploitable by attackers with Basic Attack Potential.