

Run and Reporting Rules for VMware View Planner

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1 Introduction

These View Planner Run and Reporting Rules define how to correctly measure and report performance using the View Planner benchmark. A View Planner benchmark score is the number of VDI mark Desktop Users. Results using or referencing the VDI mark View Planner metric can be published, or made public in any other manner, only if they meet the requirements detailed in this document.

Prior to version 3.0, View Planner was available as a flexible, configurable, VDI workload generator tool, with rules for any public use of View Planner data, but it was not an official benchmark. The 3.0 version of View Planner is an official benchmark that requires restricted settings for standardization. Users may still use View Planner in flexible mode, i.e., with any of the configuration settings, under the academic and research use rules contained in this document.

1.1 Definitions

In a virtualized environment, the definitions of commonly-used terms can have multiple or different meanings. To avoid ambiguity, this section defines terms that are used throughout this document:

- **Server:** A server is a system that is capable of supporting a single native operating system or hypervisor. A server consists of one or more enclosures that contain hardware components such as processors, memory, network adapters, and storage adapters, as well as the mechanism that provides power for these components. In the case of a blade server, the blade enclosure is defined as part of the server.
- **SUT:** The SUT, or System Under Test, is defined as the servers, the virtualization layer, and the performance-critical components that execute the defined workloads and operations of View Planner.

These components include:

- the servers running both the desktop and the client virtual machines,
- the networking infrastructure connecting these servers,
- any external storage hardware and all hardware necessary to connect the servers and the storage subsystem, such as fibre-channel switches (in the case of SAN storage) or network switches (in the case of NAS storage).

The server or servers running vCenter, the vCenter database, View, View Composer, an Active Directory server, and the View Planner controller appliance, as well as the storage used for these servers and any networking infrastructure not described above, are not considered part of the SUT.

2 View Planner Reporting Rules

This section describes the requirements and options for publishing View Planner results and describes a review process that is required prior to publication of a View Planner result. This section also includes a set of fair-use rules for use of View Planner results in competitive comparisons and for use in academic and research papers.

2.1 Result Review and Publication Process

Prior to publishing any View Planner result, or making it public in any other manner, that result must be approved by VMware. A request for such approval requires the formal submission to VMware of a full disclosure report of the View Planner result along with the following supporting documentation:

- a) Submitter will deposit, via FTP, the appropriate submission information as defined by Section 2.5 of this document. For the FTP address and access information send an inquiry email to benchmark@vmware.com.
- b) Once the submission is received, VMware will review and provide feedback on the submission within 10 business days.
- c) A result will typically be approved by VMware for publication if either:
 - no issues were detected, or
 - all issues were satisfactorily addressed during the course of the review.
- d) VMware will send to the submitter an official message with the final status of the review for each separate submission.

If VMware determines that the View Planner test was run in full compliance with these rules VMware will publish the result on the VMware View Planner results web page unless:

- a) The submitter requests that publication be delayed (to coincide with a product release, for example), or
- b) The submitter withdraws the result before publication.

View Planner results may be referenced by other publication materials once published on the VMware View Planner Results web page.

If VMware determines that the View Planner test was not run in full compliance with these rules, VMware will not approve that result for publication and the user must not use that result in any public disclosure. The user can, if they wish, rerun the test with any changes needed to bring it into compliance with these rules, then submit the new results and full disclosure report for review.

The user may withdraw a submission at any time while it is under review.

2.2 Handling Compliance Issues in Published Results

VMware and the benchmarker will promptly handle any issues related to compliance with these rules that do not become evident until after a result has been published. If such issues arise, both parties will withdraw any web pages or downloadable reports that reference the result and will stop using the result in printed or other media. The materials

can be revised to remove the reference and republished.

VMware will maintain a separate web page for withdrawn results that provides, for each such withdrawn result, a summary of the tested platform and the reason the published result was designated non-compliant (NC), not available (NA), or code defect (CD) and withdrawn from the “Current” results page. The benchmarker may request that the entry be updated to include the description of any remedial action they've taken. For example, if the reason the result was designated non-compliant was: “Failed to meet 90 day General Availability requirement for products used,” it later could be updated to say: “All products used were generally available as of 06/07/08 and a new result has been submitted.”

2.3 Independent Publication of View Planner Results

No independent publication of View Planner benchmark results is allowed. Results that are officially accepted and published on the VMware View Planner Results webpage may be referenced in other publications.

For publication of non-benchmark results (using View Planner flexibility mode) see academic and research use in Section 2.7.

2.4 Handling of Previously Published Results

VMware retains the right to publish and reference all results that have been reviewed and approved by VMware for publication. After 12 months, the benchmarker may request that VMware move a result from the “Current” results page to the “Historical” results page.

2.5 Submission and Disclosure Requirements

View Planner result submissions must include a complete description of the system under test (SUT), including hardware, software, configuration, and tuning. This disclosure should be sufficient that a third party could use this information to duplicate the test and obtain results within a deviation of +/- 3%. The level of detail in the disclosure report should be comparable to other industry standard benchmark results. The full set of View Planner test result measurements and metrics must also be included, as described in the View Planner Installation and User’s Guide. An HTML template for the complete disclosure report is included with the View Planner documentation.

The complete disclosure report will be included with all results published on the View Planner Results web page.

2.6 Comparability of Results between View Planner Versions

VMware retains the right to update and re-issue new versions of View Planner to licensees, including updates to these rules. Minor version releases will not affect the comparability of results with prior results within the same major version. View Planner results will not be comparable if they were produced using View Planner releases with different major version numbers. Upcoming new versions will be announced via the

VROOM blog and the VMware View Planner web page. These forums will also announce the last date results based on the prior version will be accepted for review.

2.7 Fair Use: Handling of Published View Planner References

VMware requires that all published references to View Planner results adhere to the following fair-use rules:

- a) All View Planner results referenced must be from fully compliant tests for which a full disclosure is publicly available. The use of estimates is prohibited.
- b) Comparisons may be made only between results that have the same major version number.
- c) If comparisons are made between “current” and “historical” results with the same major version number, the “historical” result must be clearly identified as “historical.”
- d) Only official View Planner metrics and submetrics may be used in comparisons.
- e) Comparisons of View Planner metrics and submetrics to any other workload or benchmark metrics are not allowed.
- f) All publications that reference View Planner results must include the following attribution:
VMware® View Planner is a product of VMware, Inc.
- g) Academic and research use of View Planner is allowed, provided full disclosure of variations from fully compliant test runs are made available as part of the full academic report. Publications containing results that are not in full compliance with these rules must be clearly identified as “academic” or “research” and must not utilize the VDI mark metric name. Competitive comparisons using View Planner results in academic or research papers are not allowed. Use of View Planner in flexibility mode, i.e., with customized configuration settings, is considered research use and any publication of such results must adhere to these academic and research use rules.
- h) Academic and research use publications must be reviewed and approved by VMware to ensure completeness of data prior to publication. See section 2.1 for instructions. Academic and research use results will not be published on the VMware View Planner results web page.
- i) Academic and research results may make use of hardware and software components that are not generally available at the time of publication and are designated as pre-release or test versions (e.g., alpha, beta, release candidate, development fork, field test, prototype, etc.). In this case, the associated report must clearly identify the components that are not generally available and their planned release dates, or indicate that the component was experimental and not planned for product release.

Note: Competitive comparisons are those that involve View Planner results where one or more performance-critical components or products from competing vendors have been used and where the purpose of the comparison is to illustrate that a product or set of products outperforms another based on the differences in the competing components.

3 View Planner Run Rules

This section describes the requirements for configuring the SUT, the clients, and the test harness to produce valid and compliant test results. This section references the *VMware View Planner Installation and User's Guide* (the “*User's Guide*”), which provides the specific configuration requirements for the client and desktop virtual machines (VMs).

The required virtual hardware definitions and the required software versions for the Desktop VMs are included in the *User's Guide* and must be followed in addition to the requirements included in this document. Any question regarding compliance with either document should be clarified with VMware to ensure that valid test results are generated.

3.1 Overview of View Planner

VMware View Planner is a tool designed to simulate a large-scale deployment of virtualized desktop systems and study its effects on an entire virtualized infrastructure. The tool is scalable from a few virtual machines running on one VMware ESXi host up to thousands of virtual machines distributed across a cluster of ESXi hosts. View Planner assists in the setup and configuration of the testing infrastructure, runs a set of application operations selected to be representative of real-world user applications, and reports data on the latencies of those operations.

3.1.1 View Planner Workloads

A View Planner desktop VM contains a set of workloads, the details of which are strictly defined. This definition includes the applications running in both the desktop and client VMs, as well as the operating system, vCPU, vRAM, network, and storage requirements. In the View Planner benchmark, each application in the VM is driven from the associated client system by the application-specific load generator and/or data collection software (“Remote” mode).

The precise requirements for each Desktop VM are covered in the *User's Guide* included with the View Planner release being used. These requirements include any required software (applications, or other tools) along with version/release requirements.

3.2 Testbed Configuration Requirements

This section covers the configuration requirements for the testbed, which includes the SUT.

The user must configure their VMs according to the instructions in the *User's Guide* and follow the limitations on the software versions described there.

The server, client, and network hardware configuration requirements, as well as the associated software requirements, are also detailed in the *User's Guide*. To produce fully compliant View Planner results, all components in the testbed must have been configured according to these requirements. The resources (i.e., CPU, memory, disk, network, etc.)

allocated to each VM must not be altered by tunings that affect the balance of assigned resources.

3.2.1 Types of Changes Permitted to SUT and Clients

This section describes the types of changes to the SUT and clients that are generally permitted by these View Planner Run and Reporting Rules and the requirements sections of the *User's Guide*.

Note: A change or tuning might be deemed performance neutral when reviewed, and therefore not a compliance issue. Typically a performance neutral change will have no effect on the test (e.g., the change is ignored or overridden by another setting) or will not affect performance to a degree that the result could not be duplicated without this setting (e.g., enabling a virtual device not used in the test).

3.2.1.1 Hardware Configuration:

- a) The hardware configuration for the SUT may be modified or tuned as long as it remains a configuration supported by the respective hardware vendors and VMware, as the vendor of the virtualization product being used. Changes may include adding memory, NICs, storage adaptors, attaching storage arrays, etc.
- b) Changes to servers' BIOS or firmware parameters may be made if they are consistent with the vendor's published recommendations.
- c) All storage and file systems must use stable non-volatile media.

3.2.1.2 Virtualization Layer Configuration:

- a) The virtualization layer may be modified or tuned as long as it remains a supported configuration and the tuning is consistent with VMware's published recommendations.
- b) The virtualization layer for individual VMs may be modified or tuned as long as it remains a supported configuration and the tuning is consistent with VMware's published recommendations.

3.2.1.3 Virtual Machine Configuration:

The following guidelines apply to both desktop and client VMs:

- a) All VMs must conform to any virtual machine platform definitions specified in the *User's Guide*. The platform definition may include the number of vCPUs, the amount of memory, the storage and network requirements, and the software requirement for each VM.
- b) Each VM's software configuration can be changed only within the limits described in the *User's Guide*, which specifies minimum versions to be used and the level of upgrades that may be applied.
- c) The version of the OS HALs and kernels included in the required OS distributions, or allowed update releases, must be used.

- d) The default system services and daemons must remain enabled unless specific changes are specified in the *User's Guide*.
- e) If any VM's software configuration is changed based on the rules above (such as upgrading the VM's OS to an allowed update release), then that change must be applied to all VM's of that type, and information about the change must be listed in the Notes section of the disclosure.

3.2.1.4 View Planner Configuration:

- a) The View Planner software includes several parameters that are modified through the controller appliance web interface. These parameters and associated configuration files must be modified only as described in the *User's Guide*.
- b) View Planner software updates supplied by VMware to address problems or supply new features may be used in place of View Planner controller appliance or other components in the current release. Such changes must be documented in the notes section of the full disclosure report.

3.2.2 Types of Changes NOT Permitted to SUT and Clients

The following section describes the types of changes that are generally NOT permitted by these View Planner Run and Reporting Rules and the requirements sections of the *User's Guide*.

3.2.2.1 Hardware Configuration:

- a) Features that are not consistent with the hardware vendor's published recommendations must not be used in the SUT.

3.2.2.2 Virtualization Layer Configuration:

- a) Features that are not consistent with VMware's published recommendations must not be used in the configuration of the virtualization layer.
- b) Features that are not consistent with VMware's published recommendations must not be used in the per-VM virtualization configuration.
- c) Configuration changes that alter the balance of assigned resources (CPU, memory, disk, network) for **specific** VM's are not permitted. This includes optimizations that increase or decrease the amount of a given resource allotted to a specific VM when the system is under load.

3.2.2.3 Virtual Machine Configuration:

- a) No changes may be made to the tuning parameters for the guest OS unless specified in the *User's Guide*.
- b) No changes may be made that alter the resources allotted to specific VMs to the advantage or disadvantage of any other VM.

3.2.2.4 Client Software and Other Configuration:

- a) No changes may be made to any workload-specific client-side code unless the *User's Guide* includes specific directions to do so.

3.2.2.5 View Planner Controller Appliance Configuration:

- a) The View Planner controller appliance parameters and configuration files must not be modified except as described in the *User's Guide*.
- b) Changes to the controller appliance software are not allowed with the exception of updates supplied by VMware.
- c) No changes may be made to View Planner software, including porting to other platforms.
- d) No changes may be made to any client resident code supplied as part of the View Planner distribution, unless the *User's Guide* specifies that the file or designated parameters can be changed.
- e) No changes may be made to any Virtual Machine workload-specific application, the workload itself including the source files or web pages for the workloads, or the View Planner code that runs on the desktop and controller VMs, unless the *User's Guide* includes specific directions to do so.

3.2.3 Types of Changes to SUT and Clients Not Covered

- a) Any changes, which may or may not have been explicitly allowed or disallowed by these rules or the *User's Guide*, should be reviewed with VMware prior to their use.

3.3 Product Availability Requirements

All hardware and software components that compose the SUT must meet the following product availability requirements at the time the associated View Planner result is published and in the time period immediately following the publication:

- a) The hardware and software components are either generally available (GA) products or are pre-release versions within 90 days of official GA release. To be considered generally available, a product must be shipping and fully supported by the vendor or its designated support channel. If a pre-release component is used, the publisher must have verified that the vendor is committed to making the component generally available within the 90-day timeframe and that the vendor represents that the performance measured is generally representative of the performance to be expected on the same configuration of the release system. The publication of a View Planner result with a forward availability date is considered a public commitment that any potential customer for that component must be able to confirm with the vendor or supplier.
- b) Hardware and software components that were generally available within the previous five years but that are no longer available from the original vendor may be used in the SUT if the original general availability date is noted in the disclosure file and the components are still supported by their vendor.
- c) All products used must remain on the market for 60 of the first 90 days after they first

become generally available. If a product is removed from the market for more than 30 days during the first 90 days, it is considered “Not Available” (NA). Replacement by a new similar component or new version with equivalent or better performance is considered acceptable and not a reason for a NA designation.

- d) Equivalent or better performance in the products that comprise the SUT must remain available during the first 90 days after the SUT becomes GA or after the result is published, whichever is later. To have equivalent performance requires that any regression would reduce the View Planner result by no more than 3%.

4 Handling Run and Reporting Rule Compliance

To ensure that users adhere to the View Planner Run and Reporting Rules, this section summarizes typical compliance issues and how they will be handled to ensure the integrity of the benchmark and View Planner metrics.

4.1 Compliance Issues Found Prior to Publication

While a submission is in review, issues related to the full disclosure report (FDR) will be brought to the attention of the submitter so that the report can be updated. If the issues raised point to a possible violation of the run and reporting rules, the submitter will be asked to clarify the situation or to rerun the benchmark in compliance with the rules. The submitter may withdraw the submission during the review period and the results will not be published.

4.2 Compliance Issues Found after Publication

If a compliance issue with the FDR is found after the submission has been published, VMware will work with the submitter to correct the FDR for re-publication. If the compliance issue raised points to a run and reporting rules violation, then VMware may remove the result in question from the View Planner results web page and may request that references to the result be taken down (see section 2.2). The submitter is encouraged to make a new compliant run and submit the new result for review and publication. VMware reserves the right to take action if references to View Planner results that have been designated non-compliant remain on the submitter’s website or on other media they control.

4.3 Compliance Issues when Pre-Release Product is Not Released

If pre-release products have been used and those products have not become generally available by the end of the 90-day window (see section 3.3) then the result will be designated non-compliant. Any publication of the result will be handled as described in sections 2.2 and 4.2 above.

4.4 Compliance Issues when Product is Not Available

If it is found that within 90 days of the publication of a View Planner result or the general availability date of the SUT, whichever is later, performance critical products used in the

SUT have been taken off the market for more than 30 days during that period, then that result will be designated non-compliant. Any publication of the result will be handled as described in section 2.2. The user is encouraged to make a new compliant run and submit the new result for review and publication. Note: Replacement by a new similar component or new version with equivalent or better performance is considered acceptable.

4.5 Compliance Issues when Result is Not Reproducible

If within 90 days of the publication of a View Planner result or the general availability date of the SUT, whichever is later, it is found that there has been a performance regression of more than 3%, then that result will be designated non-compliant. Any publication of the result will be handled as described in sections 2.2 and 4.2 above.

5 Caveats

VMware reserves the right to modify the View Planner code, workloads, and documentation (including these Run and Reporting Rules) as needed to ensure the value and integrity of View Planner as a performance tool and benchmark for virtualization. The latest published edition of these Run and Reporting Rules will apply to all View Planner releases and View Planner results unless specifically stated to the contrary.

If View Planner users have questions or concerns regarding these rules and their interpretation, or any of the View Planner materials, they are strongly encouraged to contact VMware for clarification. Additional feedback on View Planner is welcomed as well. The View Planner team may be contacted at viewplanner-info@vmware.com.

Notice:

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