Cirba Inc. et al v. VMware, Inc. Doc. 839

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CIRBA INC. (d/b/a DENSIFY) and CIRBA IP, INC.,	:	
Plaintiffs/Counter-Defendants,	:	
v.	:	C.A. No. 19-742-LPS
VMWARE, INC.,	:	
Defendant/Counter-Plaintiff.	:	

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MEMORANDUM OPINION

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STARK, U.S. District Judge:

Plaintiffs Cirba Inc. and Cirba IP, Inc. (collectively, "Plaintiffs" or "Densify") originally filed suit against Defendant VMware, Inc. ("Defendant" or "VMware") on April 25, 2019, alleging infringement of their U.S. Patent Nos. 8,209,687 (the "'687 Patent") and 9,654,367 (the "'367 Patent"). (D.I. 1) Densify's patents relate to virtualization technology and management of virtual environments. VMware raised counterclaims for infringement of its U.S. Patent Nos. 8,875,266 (the "'266 Patent"), 10,069,752 (the "'752 Patent"), 8,336,049 (the "'049 Patent"), and 9,521,151 (the "'151 Patent"). (D.I. 150) On September 20, 2019, the Court granted Density's motion to sever VMware's counterclaims from the expedited trial schedule adopted for litigating Densify's '687 and '367 Patents. (D.I. 194) Following a nine-day jury trial on the two Densify patents in January 2020, and with post-trial motions relating to the jury's verdict trial currently pending before the Court, the Court now turns to the issue of claim construction with respect to VMware's asserted patents.

The parties submitted their joint claim construction brief on July 9, 2020. (D.I. 788) The parties' submissions include expert declarations. (D.I. 789 Exs. A-1, A-2, B-1) The Court held a claim construction hearing on August 7, 2020. (*See* D.I. 820 ("Tr."))

I. LEGAL STANDARDS

The ultimate question of the proper construction of a patent is a question of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015) (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388-91 (1996)). "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal citation and quotation marks omitted). "[T]here is no magic formula or catechism for conducting claim construction."

Id. at 1324. Instead, the Court is free to attach the appropriate weight to appropriate sources "in light of the statutes and policies that inform patent law." *Id.*

"[T]he words of a claim are generally given their ordinary and customary meaning . . . [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1312-13 (internal citations and quotation marks omitted). "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted). The patent "specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

While "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent." *Id.* (internal citation omitted).

It is likewise true that "[d]ifferences among claims can also be a useful guide . . . . For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Id.* at 1314-15 (internal citation omitted). This "presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim." *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003).

It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316.

It bears emphasis that "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)) (alteration in original) (internal quotation marks omitted).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence," "consists of the complete record of the proceedings before the [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

"In some cases . . . the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841. "Extrinsic evidence consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the

meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the accepted meanings of terms used in various fields of science and technology." *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Id.* Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, while extrinsic evidence "may be useful to the court," it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999).

Finally, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would exclude the inventor's device is rarely the correct interpretation." *Osram GmbH v. Int'l Trade Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (internal quotation marks omitted).

II. CONSTRUCTION OF DISPUTED TERMS

A. "Provisioning [virtual machines]"[1]

VMware No construction, or plain and ordinary meaning. Alternatively, "supplying and configuring [virtual machine] computing resources."
Densify "Instantiating, starting, stopping, suspending and de-allocating, or similar activity."
Court "For example, instantiating, starting, stopping, suspending and de-allocating, or similar activity."

VMware argues that "provisioning" is a well-known term that needs no construction but, if it is construed, should be given its plain and ordinary meaning. (D.I. 788 at 4-5) VMware also argues that Densify's proposal improperly attempts to limit the term to the actions expressly recited in dependent claim 7, in conflict with the specification and prosecution history. (*Id.* at 5) For example, VMware points to the specification, which indicates that "provisioning" is not limited to the examples in claim 7 and more broadly includes various ways of supplying and configuring virtual machine ("VM") resources. ('049 Patent col. 1:26-28)

Densify responds that its proposal is consistent with the definition provided in the specification: "provision (e.g., instantiate, start, stop, suspend and de-allocate, etc.) virtual machines." ('049 Patent col. 3:8-9) Densify points to the claim language and the Wood reference relied on by VMware and argues that neither requires more than "instantiating, starting, stopping, suspending, de-allocating, etc." virtual machines in accordance with resource utilization. (D.I. 788 at 7-8)

[1] This term appears in claims 1, 10, and 16 of the '049 Patent.

The Court agrees with Densify that VMware's proposal improperly narrows the claim term absent "a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (internal citation omitted). The list of examples in the specification is non-exhaustive, as indicated by the use of "e.g." and "etc." ('049 Patent col. 3:7-12) VMware's alternative proposal will also not be adopted because the claim language and specification do not support including "configuring" in the definition of "provisioning" (although the open-ended nature of the Court's construction means that "configuring" is not necessarily excluded either). The Court will adopt Densify's proposal, prefacing it with "For example," to clearly convey the non-exhaustive, exemplary meaning provided in the specification.

B. "Virtual machine utilization for the application"[2]

VMware No construction, or plain and ordinary meaning. Alternatively, "utilization of virtual machine computing resources for the application."
Densify "Number of virtual machines required for the application."
Court "Utilization of virtual machine computing resources for the application."

VMware contends that Densify's proposal reads a limitation from dependent claim 4 – "number of virtual machines" – into the independent claims, explaining instead that "virtual machine utilization" refers to using VM computing resources generally, as confirmed by dependent claims and the specification. (D.I. 788 at 12-13; *see also* '049 Patent cls. 3, 5; *id.* col. 1:25-28, 2:52-53, 3:60-63, 4:41-44; *id.* figs. 3, 5) Densify responds that all of the examples from

[2] This term appears in claims 1, 10, and 16 of the '049 Patent.

the specification on which VMware relies are "directed to the provisioning of the ***number*** of virtual machines required for the application in accordance with an adjusted prediction based on resource utilization statistics, or the context of billing subsequent to the provisioning of the number of virtual machines." (D.I. 788 at 13)

The Court agrees with VMware that Densify's proposal improperly limits the claim scope to a narrow example from dependent claim 4 and that the doctrine of claim differentiation favors VMware. *See generally Phillips*, 415 F.3d at 1314-15 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.") (internal citation omitted). "Virtual machine utilization" in the context of the '049 Patent would not be understood by a person of ordinary skill in the art ("POSA") as having the same meaning as "number of virtual machines." Further, as VMware points out on reply, dependent claims 5 and 6, as well as figure 3, recite examples beyond the narrow "number of virtual machines." (*See, e.g.*, '049 Patent cls. 5, 6; *id.* fig. 3, col. 2:52-53, 4:41-44)

C. "Receiving/received resource utilization statistics"[3]

VMware No construction or plain and ordinary meaning. Alternatively, "receiving/received past or current resource utilization statistics" or (as modified at the hearing) "receiving/received past, current, or future resource utilization statistics."[4]
Densify "Receiving real-time resource utilization statistics" / "received real-time resource utilization statistics."
Court "Receiving/received past, current, or future resource utilization statistics."

[3] This term appears in claims 1, 8-10, 13, 14, 16, 19, and 20 of the '049 Patent.

[4] At argument, VMware agreed to the Court's proposal to add to its construction the word "future" to more closely match the language of the patent. (Tr. at 31-32)

The parties dispute whether receiving resource utilization statistics is limited to "real-time" statistics or whether it may include "past" statistics. (D.I. 788 at 15-18)[5] The Court agrees with VMware that the claims do not limit adjusting a prediction using only "real-time" statistics and the specification discloses broader embodiments. (*Id.* at 15-16; *see also* '049 Patent cls. 1, 9, 10, 14, 16, 20; *id.* col. 4:7-20)

Densify argues that the claim language logically requires "past" statistics at the "generating" step, so "past" statistics cannot be what is used at the subsequent "receiving" step. (D.I. 788 at 16) But, as VMware correctly points out, the Patent states that the "resource utilization metrics received" include "past, present, and future samples." ('049 Patent cls. 9, 14, 20; *id.* col 4:7-20) The Court is persuaded that a POSA would find it logical that "past resource utilization statistics" are received in the "generating" step, and additional "past" statistics (in addition to "real-time" statistics) may be received in the "receiving" step. As VMware illustrates on reply, "the method may 'generate' a prediction based on day-old resource utilization statistics, followed by 'receiving' more current (but not necessarily 'real time') statistics to adjust the prediction." (D.I. 788 at 17; *see also* '049 Patent col. 4:7-20)

D. "Transmit[ting] instructions relating to provisioning virtual machines"[6]

VMware Not indefinite.
Densify Indefinite.
Court Not indefinite.

[5] The parties' agree that the steps in claims 1, 10, and 16 are sequenced, i.e., the "generating" step must precede the "receiving" step. (D.I. 788 at 1)

[6] This term appears in claims 1, 10, and 16 of the '049 Patent.

Densify's indefiniteness argument is based on its contention that "instructions" has no antecedent basis: "[t]he claim neither explicitly nor implicitly indicates ***what*** the instructions are or ***how*** the instructions are determined." (D.I. 788 at 19) VMware counters that the term provides reasonable certainty as to claim scope, as the claims and specification describe "transmitting instructions" to provision VMs so they can tackle "future demand . . . in accordance with the adjusted generated prediction." (*Id.* at 18; *see also* '049 Patent cls. 1, 10, 16; *id.* col. 3:7-18, 3:64-4:2; figs. 4, 5)

"[A] patent's claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co., Ltd. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

The claim term is not indefinite, as the patent includes explanation of the purpose of the instructions to be transmitted, as well as examples of the use of the instructions, such that a POSA would understand with reasonable certainty the scope of the invention. (*See, e.g.*, '049 Patent col. 3:12-18 ("Upon receiving such instructions from analytics engine 405, service manager 420, in turn, communicates with service library 425, which stores the relevant technology (e.g., platform, software, data, etc.) that is needed to provision a particular virtual machine (e.g., to run an application server, database server, directory server, web server, etc.) for a customer's particular needs."); *see also id.* col. 3:64-4:2)) Densify's antecedent basis argument also fails, as Densify has not shown either that such a basis is required or that, even if it were required, its absence renders the claim indefinite. *See Yodlee, Inc. v. Plaid Techs., Inc.*, 2016 WL 204372, at *12 (D. Del. Jan. 15, 2016) ("A failure to provide antecedent basis does not

necessarily render a claim indefinite [as long as a skilled artisan can] discern the boundaries of the claim based on the [intrinsic record] and the knowledge in the relevant art.") (internal quotation marks and citations omitted). There is not clear and convincing evidence of indefiniteness.

E. "Identifying"[7]

VMware No construction or plain and ordinary meaning.
Densify "Specifically or particularly indicating."
Court No construction necessary.

Densify maintains that a "specific[]" and "particular[]" indication is required to assess "whether the current host platform matches one of the hardware platforms identified by the policies" "for which the virtual machine is authorized to execute." (D.I. 788 at 23-24; '266 Patent cl. 1) The portions of the specification on which Densify relies suggest to the Court, instead, that construction of this commonly-known word is not needed. The specification discusses "particularly identified system hardware or computer platforms" ('266 Patent col. 1:19-25), execution on "particular systems" (*id.* col. 1:27-31), use of a specific set of application features on a "specific host platform" (*id.* col. 13:35-41), and "unique identification" of the allowed host platforms (*id.* col. 14:53-58), which indicates that "identifying" does not inherently contain these "specific" and "particular" qualifications except where they are expressly called out (as they are not in claim 1 of the '266 Patent).

[7] This term appears in claim 1 of the '266 Patent.

F. "Prohibiting the virtual machine from executing"[8]

VMware No construction or plain and ordinary meaning.
Densify "Terminating the virtual machine, or preventing the virtual machine from initializing or completing initialization."
Court "For example, terminating the virtual machine, or preventing the virtual machine from initializing or completing initialization."

Densify's proposed construction narrows the meaning of "prohibiting" to "terminating" or "preventing . . . from initializing" or "preventing . . . from . . . completing initialization." (D.I. 788 at 25-27) VMware criticizes Densify's proposal for introducing arbitrary limits without support in the specification or a clear intention by the patentee to limit the claim scope. (*Id.* at 25)

The Court disagrees with Densify's argument that the use of the word "terminate" in the specification (*id.*), and the "consistency and repetitiveness" with which it is used (Tr. at 43), warrant a finding that "the patentees have effectively defined the term" (D.I.. 788 at 25). Densify concedes, as it must, that while the specification does use "terminate," it also once uses the term "prohibit" in the same context. (*Id.* at 26; *see also* '266 Patent at 4:62-67 ("security policy controller may . . . prohibit the virtual machine from executing")) Moreover, the Court agrees with VMware that the embodiments on which Densify relies are examples and the claim is not limited to those examples. Indeed, at argument, Densify conceded that nothing in the intrinsic evidence requires an exclusionary reading of the examples. (*See* Tr. at 43)

[8] This term appears in claim 1 of the '266 Patent.

At argument, VMware stated it would have no objection to the Court adopting Densify's proposed construction with the addition of "e.g." ("for example") at the beginning, to make clear to the jury that the list in the construction is exemplary and not limiting. (Tr. at 39)

G. "Permitting the virtual machine to execute" / "authorized to execute"[9]

VMware No construction or plain and ordinary meaning.
Densify "Permitting the virtual machine to initialize or continue running" / "permitted to initialize or run."
Court "For example, permitting the virtual machine to initialize or continue running" / "for example, permitted to initialize or run."

The parties agree that their disputes about these claim terms are the same as their disputes about the preceding term discussed immediately above. The Court's resolution is the same as well.

H. "Policies"[10]

VMware "Data defining access and/or operating controls on the operation of virtual machines on host platforms."
Densify "Data identifying one or more hardware platforms for which the virtual machine is authorized to execute."
Court "Data defining access and/or operating controls on the operation of virtual machines on host platforms."

[9] This term appears in claim 1 of the '266 Patent.

[10] This term appears in claim 1 of the '266 Patent.

As Densify states in its responsive briefing, "[t]he parties agree that 'policies' are 'data,' but differ as to how to define what that data does." (D.I. 788 at 29) VMware's proposed construction is based on the specification's statement that "[p]olicy control files 100 are used to store information defining access and operation controls on the operation of the virtual machine" operating on host platforms. (*Id.* at 28; *see also* '266 Patent col. 6:41-49) Densify's proposed construction imports language from claim 1 itself: "the policies identifying one or more hardware platforms for which the virtual machine is authorized to execute." (D.I. 788 at 28-29; *see also* '266 Patent cl. 1)

The Court rejects Densify's proposed construction. The most natural reading of the claim language to a POSA is that the policies perform a particular function, i.e., "identifying one or more hardware platforms for which the virtual machine is authorized to execute." ('266 Patent cl. 1) But the policies themselves are not limited – by the claim language or by the specification – to that function. Thus, Densify's proposed construction improperly narrows the meaning of "policies." Moreover, as VMware persuasively argues, the patent does not require both access controls and operating controls, justifying the Court's inclusion of "and/or" in its construction. (*See* Tr. at 46; *see also* '266 Patent col. 6:47-49) This view is supported by the specification's examples, some of which refer to policy control files defining access controls while others refer to policy control files defining operating controls. (*See, e.g.*, '266 Patent col. 7:24-29, 9:58-64)

I. "Optimizing" / "optimize"[11]

VMware No construction or plain and ordinary meaning.
Densify "Achieving a user-desired state."

[11] This term appears in claims 1 and 12 of the '151 Patent.

Court
"Achieving a user-desired state."

These terms, which appear in the preambles of claims 1 and 12 of the '151 Patent, are, by the parties' agreement, limiting. (*See* D.I. 737-1 Ex. C) VMware argues that they need no construction, as none would assist the factfinder, particularly given the context in which the claim terms appear. (D.I. 788 at 31)

Densify responds that "[t]he '151 patent is directed to 'optimizing' a cloud environment by achieving a 'desired state' through use of 'policies.'" (*Id.* at 32) As support, Densify points to the "Brief Summary of the Invention," which discusses a "policy-driven method for optimization" in which the method "determines whether a cloud environment should be changed to achieve a more desired state based on at least one user-defined policy," as well as other parts of the specification. (*Id.*; *see also* '151 Patent cols. 1:8-11, 1:45-57, 1:62-2:11, 3:33-65, 4:6-23, 4:51-5:18, 5:23-35, 5:38-67, 6:22-33, 7:8-23, 7:42-8:50, 8:64, 9:11-10:67, 12:21-53) Densify also relies on the prosecution history. (D.I. 788 at 32) In distinguishing a prior art reference, Parashar, the patentees stated that the reference "does not teach monitoring current state of operations of a cloud, setting a desired state of operations, and making recommendations to realize the desired state – i.e., optimizing the operations of the cloud environment as recited in claim 1." (D.I. 737-3 Ex. K at VMW00100098) The Examiner also noted that the prior art, including Parashar, did not "expressly disclose a system, and method for optimizing a cloud environment . . . wherein the system and method [b]ased on an evaluation, generate, a recommended change to the operating conditions of the cloud environment to achieve at least one desired state consistent with the at least one user-defined policy; and [t]ransmit the recommended change to the cloud environment for changing the cloud environment from the current state to the desired state." (*Id.* at VMW001000109)

The Court agrees with Densify that the terms should be construed and that the '151 Patent makes clear that "optimizing" refers to "achiev[ing] a more desired state." (*See, e.g.*, '151 Patent at 1:45-57) VMware itself acknowledges that "the claim language expressly links 'the desired state' to the 'recommended change.'" (D.I. 788 at 44-45) This makes it clear that the point of optimization in the context of the invention is not to "make as perfect, effective, or functional as possible," as VMware argues, but, rather, to "achiev[e] a more desired state."

J. "Operating conditions"[12]

VMware Not indefinite. No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

Densify's indefiniteness argument is essentially as follows: (i) "operating conditions" "appears to be synonymous with 'state'" based on the single instance of "operating conditions" in the specification; and (ii) if understood to mean "state," then "operating conditions" is ambiguous. (D.I. 788 at 35-36; *see also* '151 Patent col. 1:25-28) VMware responds that the plain meaning of the claim term, which is widely used in the art, is unambiguous. (D.I. 788 at 36; *see also* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 14-16) VMware also contends that the specification describes "operating conditions" and its use in the claim. (D.I. 788 at 37; *see also* '151 Patent col. 3:45-50, 9:5-19, 10:26-39, 11:10-24, 11:57-65)

[12] This term appears in claims 1 and 12 of the '151 Patent.

Densify has not proven indefiniteness. The Court is not persuaded that "operating conditions" is synonymous with "state;" the specification does not actually define the term "operating conditions." Nor need it. *See, e.g.*, *Magna Elecs., Inc. v. TRW Auto. Holdings Corp.*, 2015 WL 11401855, at *14 (W.D. Mich. Apr. 28, 2015) ("There is no requirement that every term appearing in the claims must be specifically defined or used in the specification."). Rather, as VMware argues, the specification generally describes "operating conditions." (*See* '151 Patent col. 3:45-50, 9:5-19, 10:26-39, 11:10-24, 11:57-65)

K. "The at least one policy set"[13]

VMware Not indefinite. The "the at least one policy set representing user desired operation" of claim 1d/12c is the "at least one policy representing user desired operation" in claim 1c/12b.
Densify Indefinite.
Court Not indefinite.

Claim 1 of the '151 Patent provides, in relevant part:

> A computer-implemented method for optimizing cloud environment through delegated actions using a cloud infrastructure optimization system, including at least a computer processor and a memory, the memory storing at least one data module, the method comprising the steps of:
>
> > [a] gathering data representing operating conditions of a cloud environment using a monitoring system executing at the computer processor, which is operatively connected to the cloud environment over a network;
> >
> > [b] determining a current state of the operating conditions of the cloud environment;

[13] This term appears in claims 1 and 12 of the '151 Patent.

> [c] storing, at the memory, at least one policy representing user desired operation of the cloud environment, and at least one user-defined policy to authorize a change to the cloud environment;
>
> [d] evaluating, using a policy engine executing at the computer processor, whether the cloud environment should be changed to achieve a more desired state based on the current state of the operating conditions and ***the at least one policy set*** representing user desired operation of the cloud environment and the at least one user-defined policy to authorize a change to the operating conditions of the cloud environment.

('151 Patent cl. 1) (emphasis added)

Densify contends that "the at least one policy set" term has no antecedent basis and, therefore, the claim is indefinite. (D.I. 788 at 38) VMware argues that "the at least one policy set," which appears in the "evaluating" step of claim 1 (element 1d), has its antecedent basis in the "at least one policy" of the preceding "storing" step (element 1c). (*Id.*) VMware adds that the addition of the word "set" does not render the claim indefinite, "as the plain meaning of 'policy set' is one or more policies." (*Id.*) To Densify, VMware is incorrect to find the antecedent basis in the "storing" step because "(1) the term 'set' is repeatedly and consistently used in the specification to include ***more than one*** thing; (2) claim construction principles forbid simply rewriting the claim language to resolve an ambiguity; and (3) even if the antecedent basis issue were corrected (by replacing 'the' with 'an'), that would still not permit a POSA to ascertain, with reasonable certainty, the scope of the claim." (D.I. 788 at 38-39; *see also* '151 Patent col. 1:53 (using "set"); *id.* col 1:67, 2:1-2, 4:1, 7:21-22, 12:62-63, 13:2-3, 14:20, 15:4, 15:7, 15:38 (all same))

While constructions that result in claim language being superfluous are disfavored, *see, e.g.*, *Tex. Instruments Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1171 (Fed. Cir. 1993), the

Court is persuaded that a POSA would understand, in light of the specification and the prosecution history, that "the at least one policy set representing user desired operation" refers to the "at least one policy representing user desired operation" in the preceding "storing" step, of the claim. In the Court's view, the addition of the word "set" in claim 1d does not change that the term clearly refers to the "at least one policy set" of claim 1c. (*See also* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 17-19) Densify has failed to meet its burden to show indefiniteness by clear and convincing evidence.

L. "Objective"[14]

VMware No construction or plain and ordinary meaning.
Densify "A desired state."
Court Plain and ordinary meaning.

VMware contends that the term "objective" is a common English word meaning "goal," which requires no construction and is not indefinite. (D.I. 788 at 41) VMware finds support for its view in claims 3 and 4 and the specification. (*See id.*) (citing '151 Patent col. 1:8-11, 6:10-13, 9:30-36) VMware criticizes Densify's proposed construction for conflating "objective" with a different term, "desired state." (*Id.*; *see also* '151 Patent cls. 1, 12)

Densify points to the specification, which explains that "[a] policy represents a desired state for a cloud environment. . . . The desired state can span a plurality of objectives, such as cost, performance, availability and security." (D.I. 788 at 42; *see also* '151 Patent col. 3:11-18)

[14] This term appears in claims 3, 4, 14, and 15 of the '151 Patent.

In this way, according to Densify, the specification defines an "objective" as "a desired state." (D.I. 788 at 42)

The Court agrees with VMware that a POSA would understand the claims are using the term "objective" according to its plain and ordinary meaning – a meaning which Densify does not dispute – and that Densify's proposed construction improperly conflates the terms "objective" and "desired state." *See generally Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) ("[D]ifferent claim terms are presumed to have different meanings.").

M. "The desired state"[15]

VMware Not indefinite. No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

Claim 1 of the '151 Patent provides, in relevant part:

> A computer-implemented method for optimizing cloud environment through delegated actions using a cloud infrastructure optimization system, including at least a computer processor and a memory, the memory storing at least one data module, the method comprising the steps of:
>
> . . .
>
> [d] evaluating, using a policy engine executing at the computer processor, whether the cloud environment should be changed to achieve a more desired state based on the current state of the operating conditions and the at least one policy set

[15] This term appears in claims 1 and 12 of the '151 Patent.

> representing user desired operation of the cloud environment and the at least one user-defined policy to authorize a change to the operating conditions of the cloud environment;
>
> [e] based on the evaluation, generating, using a recommendation engine executing at the computer processor, a recommended change to the operating conditions of the cloud environment to achieve at least one desired state consistent with the at least one user-defined policy;
>
> [f] transmitting the recommended change to the cloud environment for changing the cloud environment from the current state to ***the desired state***.

('151 Patent cl. 1) (emphasis added)

Densify contends the term is *per se* indefinite because it has two antecedent bases: the "a more desired state" language of element 1d and the "at least one desired state" of element 1e. (D.I. 788 at 43-44) The Court agrees with VMware, however, that "the desired state," which appears in claim 1's "transmitting" step (1f), is not indefinite because there is a clear antecedent basis for the term in the preceding "generating" step (1e). (*Id.* at 43) This conclusion is supported by the specification. (*See* '151 Patent col. 1:54-60, 2:2-11, 6:1-10; Tr. at 57) Further, while VMware's expert opines that the claim is not indefinite, Densify's expert does not opine that it is indefinite. (*Compare* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 20-21 *with* Madisetti Decl. (D.I. 789 Ex. B-1) (not addressing this claim term)) Densify has failed to meet its burden to show indefiniteness by clear and convincing evidence.

N. "User-defined threshold"[16]

VMware Not indefinite. No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

Densify argues that this term is indefinite because "it is nowhere discussed in the specification" and "the claim language does not state what is being measured against the 'threshold' to determine if it is met." (D.I. 788 at 47) The Court agrees with VMware that the term is not indefinite and is used according to its plain and ordinary meaning. The specification provides several elucidating examples of "user-defined thresholds," which would help a POSA to have reasonable certainty as to claim scope. ('151 Patent col. 3:22-32, 7:55-65, 12:37-40; Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶ 25) Densify has failed to prove indefiniteness by clear and convincing evidence.

O. "At least one recommended action"[17]

VMware Not indefinite. No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

[16] This term appears in claims 2 and 13 of the '151 Patent.

[17] This term appears in claims 2, 5, and 6 of the '151 Patent.

Densify contends that nothing in the claim recites who or what determines the "recommendation action for changing the cloud environment," so a POSA would not be able to ascertain with reasonable certainty how the recommended action is determined. (D.I. 788 at 49-50) Densify further argues that claim 5, which depends from claim 2, is indefinite also because the step of "making [the] at least one recommended action" is optional. (*Id.* at 50 n.16)

VMware counters that the term "at least one recommended action" requires no construction and should be accorded its and ordinary meaning, as indicated in an illustrative embodiment. (*Id.* at 49; '151 Patent col. 12:51-53) According to VMware, if a deviation from a user-defined policy meets a user-defined threshold, claim 2 requires making "at least one recommended action" for changing the cloud environment. (D.I. 788 at 49) VMware also points to the specification for examples, such as "rightsiz[ing] a workload upon identifying that a workload has been provisioned with excess or insufficient resources" and "defin[ing] a corrective action." (*Id.*) (citing '151 Patent col. 12:37-46)

Once again Densify has failed to meet its burden to show indefiniteness by clear and convincing evidence. Instead, the Court agrees with VMware that a POSA would understand that the claimed method requires "at least one recommended action" for changing the cloud environment if a monitored deviation meets a user-defined threshold, based on the exemplary embodiments in the specification. (*See, e.g.*, '151 Patent col. 12:51-53 (embodiment "monitor[s] the cloud infrastructure resources for deviation from the policy, and propose[s] corrective action"); *see also* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 26-27)

P. "A recommended change to the operating conditions of the cloud environment to achieve at least one desired state consistent with the at least one user-defined policy"[18]

VMware Not indefinite. No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

In Densify's view, the term is indefinite because the Patent "discloses changing the cloud environment to achieve a desired state consistent with the policy representing ***user desired operation*** of the cloud environment, not a policy that provides ***authorization*** to change the cloud environment." (D.I. 788 at 52) Consequently, according to Densify, the "user-defined policy to authorize a change" is not required to be related to the "policy representing user desired operation" but, instead, could be directed at anything. (*Id.*)

VMware, pointing to the specification, argues that the term needs no construction and is used according to its plain and ordinary meaning. (*Id.* at 51-52) An example in the specification describes "a system that collects and stores data on the current state of a cloud-based environment having a policy engine capable of interpreting policies describing the desired states for one or more environments, a recommendation engine that can propose changes to an environment to make it consistent with the policies, and execution capability for executing these proposed changes upon receipt from outside the system of the necessary security authorization." ('151 Patent col. 5:54-67; *see also id.* figs. 6, 7)

[18] This term appears in claims 1 and 12 of the '151 Patent.

The Court agrees with VMware that the term is not indefinite. The specification explains that "Recommendation Engine 150 . . . may produce an optimum recommended change to a cloud environment consistent with one or more user-defined policies," and refers to "user-defined" policies that "authorize a change to the cloud environment." ('151 Patent col. 9:45-48; *see also id.* col. 1:66-2:11) This explanation would provide a POSA with sufficient information to understand, with reasonable certainty, the scope of the claim. (*See also* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 28-30)

Q. "Interfacing with the distributed computer systems at a remote resource allocation module that is located outside of the distributed computer systems"[19]

VMware No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

Densify argues that this term is indefinite because "it employs an improper prepositional phrase" and "the claim is ambiguous as to ***what*** is doing the interfacing." (D.I. 788 at 55-57; Madisetti Decl. (D.I. 789 Ex. B-1) ¶¶ 21, 24; *see also* '752 Patent col. 1:64-66, 2:20-23, 8:17-19, 9:40-45, 12:44-47, 14:49-50 (showing "interface" never used with "at" in specification)) Again, the Court disagrees. Because, as the parties agree, the '752 Patent discloses that the remote resource allocation module is "physically located outside of the distributed computer systems" ('752 Patent col. 12:28-41; *see also* D.I. 788 at 56-58), the Court is persuaded that a POSA would understand that the "at" in the "interfacing" step refers to the location associated with the

[19] This term appears in claims 1 and 9 of the '752 Patent.

remote resource allocation module (*see* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶¶ 31-33; *see also* '752 Patent figs. 1, 6). The specification also makes clear that the remote resource allocation module and the distributed computer systems are the "what" that are interfacing. (*See, e.g.*, '752 Patent col. 3:46-67, 8:26-38, 9:40-10:11)

R. "Remote resource allocation module"[20]

VMware Plain and ordinary meaning. "Remote resource allocation module" is not a means-plus-function claim term subject to 35 U.S.C. § 112(f) but complies if it is. The remote resource allocation module refers to a particular disclosed structure that performs the module's claimed functions, i.e., (i) interfacing with the distributed computer systems, (ii) receiving a plurality of computer system snapshots from the distributed computers systems, and (iii) transmitting results of the resource allocation analyses to the distributed computer systems. These functions are carried out by an access interface unit of the remote resource allocation module that communicates with the distributed computer systems via standard network interfaces and communication protocols, such as network adapters and Internet protocols.
Densify Indefinite. "Remote resource allocation module" is a means-plus-function claim term subject to § 112(f) with insufficient structure.
Court Indefinite. "Remote resource allocation module" is a means-plus-function claim term subject to § 112(f) with insufficient structure.

VMware contends that "remote resource allocation module" is not a means-plus-function term because it does not include the word "means" and Densify has not "overcome the presumption that § 112[(f)] does not apply to claim terms not including the word means." (D.I. 788 at 60) (internal quotation marks omitted) Rather, VMware continues, because the term has "'a known structural meaning, or recites either a known or generic term with sufficient

[20] This term appears in claims 1 and 9 of the '752 Patent.

description of its operation,'" "'the presumption against means-plus-function claiming remains intact.'" (*Id.*) (quoting *M2M Sols. LLC v. Sierra Wireless Am., Inc.*, 2015 WL 5826816, at *3 S(D. Del. Oct. 2, 2015)) VMware's expert supports this view, opining that resource allocation modules were well-known, and resource allocation is a well-known process. (*See, e.g.*, Menascé Decl. (D.I. 789 Ex. A-1) ¶¶ 10-13) Further, VMware argues that the '752 Patent improves conventional resource allocation techniques (D.I. 788 at 61; *see also* '752 Patent col. 8:7-11, 10:36-60), adding that the fact that the claims do not recite a particular, commercially-available example of a remote resource allocation module does not bring them under the purview of § 112(f) (D.I. 788 at 62) (citing *Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 705 (Fed. Cir. 1998) ("Even though the term 'detector' does not specifically evoke a particular structure, it does convey to one knowledgeable in the art a variety of structures known as 'detectors,' . . . preclud[ing] the application of § 112, ¶ 6.").

As to structure, VMware contends that even if § 112(f) is applied, the specification and claims recite sufficient structure. (D.I. 788 at 63) According to VMware:

> [T]he claimed functions are "interfacing with the distributed computer systems," "receiving a plurality of computer system snapshots from the distributed computer systems" and "transmitting results of the resource allocation analyses . . . to the distributed computer systems." ('752 patent, claims 1, 9, 17.) . . . . [T]hese functions are carried out by an access interface unit of the remote resource allocation module that communicates with the distributed computer systems via standard network interfaces and communication protocols, such as network adapters and Internet protocols. (*Id.*, 3:46-67, 5:3-4, 12:42-13:58)

(*Id.*)

For its part, Densify takes the view that § 112(f) applies but that the claim is indefinite due to lack of adequate disclosure of structure. Densify contends it has overcome, by a preponderance of the evidence, the presumption that means-plus-function claiming does not

apply because the claim does not use the word "means." (D.I. 788 at 63) (quoting *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018)) Densify argues that "remote resource allocation module" is not a name for a structure, and "module" is "a well-known nonce word that can operate as a substitute for "means." . . . [It] is simply a generic description for software or hardware that performs a specified function." (*Id.* at 64) (quoting *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1350 (Fed. Cir. 2015)) Densify adds that while a POSA may have been familiar with "resource allocation" generally, "the mechanism for conducting it is subjective." (*Id.* at 64) Analogizing this case to *Arendi S.A.R.L. v. LG Electronics, Inc.*, 2019 WL 3891150, at *15 (D. Del. Aug. 19, 2019), Densify argues that the claims are indefinite because "[t]he specification fails to place a POSA on sufficient notice of which [resource allocation analysis] algorithms are claimed – and which are not claimed." (*See* D.I. 788 at 66-67)

The Court finds that § 112(f) applies, as the term "remote resource allocation module" fails to provide any information to a POSA as to the relevant structure. Notwithstanding VMware's contention that "[t]he parties do not dispute that 'resource allocation modules' were structures generally known to" POSAs (D.I. 788 at 67) in fact Densify and its expert take the view that "***remote*** resource allocation . . . was ***not*** well known to POSAs" (Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶ 37 (emphasis added)). The specification provides no information as to the structure or algorithm used to perform remote resource allocation. (*See, e.g.*, '752 Patent col. 13:15-21, 37-42) (resource allocation analyses performed "using at least one resource allocation analysis algorithm") As in *Arendi*, the issue "is not whether a POSA would know, given the specification, how to implement the claimed . . . function, but instead whether a POSA would recognize the ***specification itself*** as disclosing a particular algorithm or algorithms for implementing the . . . function." *Arendi*, 2019 WL 3891150, at *13. Similarly, here, as in

Arendi, *id.* at *15, the claims are indefinite because "[t]he specification fails to place a POSA on sufficient notice of which [resource allocation analysis] algorithms are claimed – and which are not claimed."

S. "Receiving a plurality of computer system snapshots"[21]

VMware No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

According to VMware, a POSA would know to apply the plain and ordinary meaning of this term, which is that "[a]s long as two or more computer system snapshots are received, the limitation is satisfied." (D.I. 788 at 71) For support, VMware points to the specification. (*See* '752 Patent col. 1:58-2:13, 13:15-21, 14:41-61)

Densify argues that the term is indefinite because it permits two constructions of differing scope – (i) receiving a plurality of snapshots from each of the plurality of distributed computer systems; or (ii) receiving a plurality of snapshots from the totality of the plurality of distributed computer systems – without informing a POSA with reasonable certainty which of the two is proper. (D.I. 788 at 71-74) Densify concedes that the second of these possible constructions "excludes every disclosed embodiment[]," making it "especially disfavored." (D.I. 788 at 74) (quoting *Kaneka Corp. v. Xiamen Kingdomway Grp. Co.*, 790 F.3d 1298, 1304 (Fed. Cir. 2015) ("A claim construction that excludes a preferred embodiment is rarely, if ever, correct. A

[21] This term appears in claims 1 and 9 of the '752 Patent.

construction that excludes ***all*** disclosed embodiments . . . is especially disfavored.") (internal quotation marks and citation omitted).

The claim language requires only "receiving a plurality of computer system snapshots" from the "plurality of distributed computer systems." Densify's posited construction which would include the narrowing term "each of" (i.e., the first of the constructions above) would exclude all embodiments, is especially disfavored, and would not be how a POSA would understand the claim. Densify's posited construction which would include the term "totality of" also reads into the claim language which is not warranted. (*See* Tr. at 88-89) A POSA would understand, with reasonable certainty, how to determine the appropriate plurality of computer system snapshots to receive from the plurality of distributed computer systems for a given use case. (*See* Menascé Rep. Decl. (D.I. 789 Ex. A-2) ¶ 43) Densify, therefore, has failed to meet its burden to show the claim is indefinite.

T. "As defined by the computer system snapshots"[22]

VMware No construction or plain and ordinary meaning.
Densify Indefinite.
Court Not indefinite.

Densify contends that the term is indefinite "because it is not clear ***what*** is 'defined by the computer system snapshots'": (i) the "one or more recommendations regarding resource allocations" or (ii) "the distributed computer systems." (D.I. 788 at 77) But, as even Densify observes, the first of these possibilities is nonsensical because snapshots do not contain

[22] This term appears in claims 3 and 11 of the '752 Patent.

recommendations. (*Id.*; *see also* D.I. 737-1 Ex. D at 12 (agreed-upon construction for "snapshots")) Densify also contends that the second possibility is nonsensical "because the specification makes clear that the snapshots need not correspond to or describe an actual distributed computer system[]" (D.I. 788 at 77) – but the Court disagrees.

The Court is persuaded that a POSA would understand that the computer system snapshots describe the states of the distributed computer systems, including their configurations and resource usage information. For example, the '752 Patent states:

> As used herein a snapshot of a distributed computer system contains at least configuration and resource usage information of the distributed computer system at a particular moment in time. The snapshot may include the current configurations of host computers and clients running on the host computers in the distributed computer system. These configurations of the host computer and the clients may include hardware and software configurations of each host computer, clustering information, client hosting information and client information, which were described above with respect to the management computer. The snapshot may also include the current configuration of storage in the distributed computer system, including the configurations of storage devices and datastores of the storage. In addition, the snapshot may also include requirements and preferences of components in the distributed computer system. The snapshot may also include resource usage information for various components of the distributed computer system, including historical resource usage information regarding the distributed computer system. Lastly, the snapshot may also include resource allocation statistics, such as how often a client has been moved to different host computers or how often a client has consumed the entire resource allotted to that client.

('752 Patent at 7:39-62)

The Court agrees with VMware that claim 1, read in the context of the specification, reveals to a POSA that the term refers to recommendations resulting from the analysis in the "performing" step of claim 1. Densify has failed to meet its burden to show indefiniteness by clear and convincing evidence.

III. CONCLUSION

The Court will construe the disputed terms as explained above. An appropriate Order follows.