IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

EDGE NETWORKING SYSTEMS, LLC, Plaintiff, v. MICROSOFT CORPORATION, Defendant.	Civil Action No. 1:24-cv-00215-DAE

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1	Declaration of Dr. Jon B. Weissman
2	ANDREW S. TANENBAUM, MODERN OPERATING SYSTEMS, at 1-2 (2d ed. 2001)
3	WILLIAM STALLINGS, OPERATING SYSTEMS: INTERNALS AND DESIGN PRINCIPLES, at 681 (7th ed. 2012)
4	HARRY NEWTON, NEWTON'S TELECOM DICTIONARY, at 132, 382 (25th ed. 2009)
5	HARRY NEWTON, NEWTON'S TELECOM DICTIONARY, at 146, 408 (Steven Schoen ed., 27th ed. 2013)
6	MICROSOFT COMPUTER DICTIONARY, at 31, 155, 167-68, 300, 378, 413, 544, 553 (5th ed. 2002)
7	DOUGLAS DOWNING, PH.D. ET AL., DICTIONARY OF COMPUTER AND INTERNET TERMS, at 25-26, 135, 273, 374, 508-09 (10th ed. 2009)
8	DOUGLAS DOWNING, PH.D. ET AL., DICTIONARY OF COMPUTER AND INTERNET TERMS, at 23-24, 135, 278, 384 (11th ed. 2013)
9	INST. OF ELECTRICAL AND ELECTRONICS ENG'G, INC., THE AUTHORITATIVE DICTIONARY OF IEEE STANDARDS TERMS (7th ed. 2000)
10	Yongxiang Guo & Wu Deng, *Design of Network Device Driver in Embedded Linux*, INT'L CONF. ON COMPUT. APPLICATIONS AND SYS. MODELING, 2010, at V12-445 (2010)
11	T. Satyanarayna & S. Latha, *Development of Embedded Ethernet Drivers For Arm9*, 2 INT'L J. COMPUT. ENG'G RSCH., no. 8, Dec. 2012, at 280
12	Excerpts of the file history of U.S. Patent Application No. 15/836,824 (U.S. Patent No. 10,686,871)
13	Excerpts of the file history of U.S. Patent Application No. 14/295,331 (U.S. Patent No. 9,843,624)
14	*Portal Definition & Meaning*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/portal (last visited Jan. 17, 2025)

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Defendant Microsoft Corporation ("Microsoft") submits this brief in response to Plaintiff Edge Networking Systems' ("Edge") Opening Claim Construction Brief (Dkt. 31) ("Br.") addressing disputed terms of U.S. Patent Nos. 10,686,871 (the "'871"); 10,893,095 (the "'095"); and 11,695,823 (the "'823") (the "Asserted Patents").

I. CONSTRUCTION OF DISPUTED CLAIM TERMS

In construing claim terms, the Court should start with the language of claims. "[T]he context in which a term is used in the asserted claim can be highly instructive" as to its scope. *Phillips v. AWH Corp*., 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc). The "words of a claim 'are generally given their ordinary and customary meaning,'" that is, "the meaning that the term would have to a person of ordinary skill in the art [(POSITA)] in question at the time of the invention." *Id*. at 1312-13 (citation omitted).

The Court should next turn to the patent's specification. "[T]he [POSITA] is deemed to read the claim term … in the context of the entire patent." *Id*. at 1313. Thus, "the only meaning that matters in claim construction is the meaning in the context of the patent." *Trs. of Columbia Univ. v. Symantec*, 811 F.3d 1359, 1363-64 (Fed. Cir. 2016). *See also Indocon v. Facebook*, 824 F.3d 1352, 1358 (Fed. Cir. 2016) (affirming construction because "terms lack a plain or ordinary meaning in the art, and because the specification suggests limiting the scope of these claim terms"); *UltimatePointer v. Nintendo*, 816 F.3d 816, 823-24 (Fed. Cir. 2016).[1] The Court should then consider a patent's prosecution history, which can provide guidance on the scope of a claim term. *See Fenner Invs., v. Cellco P'ship*, 778 F.3d 1320, 1325 (Fed. Cir. 2015).

After the Court has considered the claim language, specification, and prosecution history (the intrinsic evidence), the Court should consider the extrinsic evidence, such as technical

[1] Edge relies on *Thorner*, but *Thorner* did not overrule *Phillips*, and these more recent Federal Circuit cases instruct that claims may be narrowed or clarified as appropriate in the context of the specification.

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dictionaries and expert testimony. Technical dictionaries "endeavor to collect the accepted meanings of terms" and are "among the many tools that can assist the court in determining the meaning of particular terminology to [a POSITA]." *Phillips*, 415 F.3d at 1318. Similarly, "expert testimony can be useful" because it can "provide background on the technology at issue" and "explain how an invention works, 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." *Id*. Extrinsic evidence should be considered "in the context of the intrinsic evidence." *Id.* at 1319.

A. "programmable network device" ('871, claims 1, 2, 4, 7, 9; '095, claims 1, 2, 7, 15; '823, claims 1, 2, 13, 19)

Microsoft's Proposed Construction	Edge's Proposed Construction
hardware networking equipment embedded with a sandboxing operating system	a network device powered by a sandboxing operating system

The parties primarily disagree on whether the network device must be a physical device. While the context of the claim does not clarify the meaning of "network device," hardware devices are a fundamental part of the infrastructure of the distributed SDN system of the Asserted Patents. *See, e.g.*, Figs. 4, 10. The specification makes clear that a "network device" is a physical device, as it defines the programmable network device (fxDevice 302)[2] as "any networking equipment embedded with a special flexible operating system (fxOS),"[3] consistent with Microsoft's proposed construction. '871 at 10:63-65. All examples of fxDevices in the specification reference hardware, for example a base-station ('871 at Fig. 10, 17:42-52) or a smart home router ('871 at Table 8, row 38). Though Edge argues that the term should not be limited to hardware, that is contrary to the purpose of the invention and leaves the jury to guess what a "network device" may be since Edge simply re-uses the term as part of its construction.

[2] Edge admits that "the claimed programmable network device is called fxDevice 302." Br. at 1.
[3] As explained in § D. below, fxOS refers to a sandboxing operating system. '871 at 10:17-19.

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The section quoted by Edge suggesting hardware and software are interchangeable appears in a section of the specification discussing *programs*, not *devices*, and thus is inapplicable.

The patentee's statements in prosecution further support Microsoft's construction and preclude Edge's. In prosecution of the parent application to the Asserted Patents (9,843,624), the patentee described the network device as hardware physically located at the wireless edge of a network (e.g. base station or eNodeB) to overcome prior art (and amended its claims accordingly). Ex. 13 at 14-15, 17-18. Contemporaneous extrinsic evidence from technical dictionaries and textbooks makes clear that a "device" is a physical device such as hardware or equipment, that comprises the lowest level of the networking architecture. *See, e.g.*, Ex. 2; Ex. 6; Exs. 7-8; Ex. 9. Further, the term "network device" is explained in technical publications from the time of the invention to be a physical device. *See, e.g.*, Ex. 10.

Edge provides no rationale for adding "powered by" to the construction or explanation of what "powered by" means, only adding confusion. A POSITA understands "powered by" to be a marketing term that is technically meaningless. Ex. 1, ¶ 54-55; §J. Edge mistakenly asserts that "embedded" is a word "found nowhere in the specification," but this is wrong: it is used in the specification to describe a network device (fxDevice) and thus is appropriate to incorporate into Microsoft's proposed construction of "programmable." '871 at 10:53-65.

B. "programmable cloud device having a plurality of virtual machines" ('871, claim 9; '095, claim 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
hardware cloud equipment embedded with a plurality of virtual machines	plain and ordinary meaning, or alternatively "a cloud platform having a plurality of virtual machines"

Here, the parties disagree on whether the cloud device must be a physical device and whether a cloud "device" is synonymous with a cloud "platform." The plain language of the claim is inconsistent with Edge's proposal. The drafters chose to use "cloud device" rather than

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"cloud platform" in the claims even though the phrase "cloud platform" appears elsewhere in the patent, recognizing that the two are not interchangeable. *PPC Broadband v. Corning Optical Communs. RF*, 815 F.3d 747, 752-53 (Fed. Cir. 2016) (citing canon "recognizing linguistic differentiation" because "it is reasonable to view the differing terms as being intended to have a different scope"). Further, the claim plainly encompasses a system with a single cloud device. Edge's proposed construction is therefore untenable, as a POSITA reading the patents would understand a single cloud device is not sufficient to encompass a cloud platform. Ex. 1, ¶28-30.

Edge mistakenly presupposes that fxCloud in the specification is the "cloud device" in the claim. Br. at 2. However, unlike with the fxDevice which is expressly defined to be a "network device," fxCloud is defined as "a flexible cloud platform"—not a "cloud device." '871 at 10:13-17. The specification makes clear that a cloud device and a cloud platform are not the same. For example, Figure 16 in the specification shows various "platform" resources and illustrates why Edge's proposed construction is wrong. '871 at 2:26-27. "Cloud platform" according to the specification corresponds to the overall system that is termed fxCloud, and all of the associated agents and resources. '871 at Fig. 16, 21:45-48. Those resources encompass physical *cloud devices* like routers and switches, as well as "VMs" or virtual machines. The claim term "cloud device" corresponds to a physical resource like a router or switch in the back end, as distinct from a "virtual machine" which corresponds to a virtual resource and is described separately in the claims. *See also* '871 at 24:15-22 (A "cloud device" means cloud equipment such as "fxCloud servers."). This is consistent with a POSITA's understanding in light of intrinsic evidence that a cloud device describes each physical resource within a backend cloud platform. Ex. 1, ¶28-30. Thus, the interpretation most true to the claim language itself and supported by the specification is that a cloud device (hardware resource) located on the backend

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could be *embedded with* virtual machines to add additional virtual resources.

Microsoft's proposed construction is also supported by the prosecution history of the parent application, where the patentee described the cloud device as being physically located at "a backend location in the network," where physical servers or switches would be located (and amended its claims accordingly). Ex. 13 at 14-15. Extrinsic evidence also supports Microsoft's interpretation, as technical dictionaries define a "device" to be a physical device. *See* §A.

C. "distributed application" / "distributed applications" ('871 claims 1, 9; '095, claims 1, 15; '823, claims 1, 19)

Microsoft's Proposed Construction	Edge's Proposed Construction
each "distributed application" is a single piece of software formed from components hosted on a network device and a cloud device [or a virtual machine on a cloud device]	plain and ordinary meaning; or alternatively an application formed from the secure communication between an application on the programable network device and an application on the programmable cloud device"

The Court should construe "distributed application" to ensure its plain and ordinary meaning is true to the invention, as Microsoft proposes. *See Symantec*, 811 F.3d at 1363. The claims recite a "distributed application" that is "form[ed]" from the two "network applications." In this context, the term "form" indicates to a POSITA that the first and second "network applications" are not independent and instead must combine to "form" "a single piece of software" as Microsoft proposes. Microsoft's proposal is faithful to the invention because it requires the term "distributed application" to operate as "a single piece of software," providing a function beyond that provided by the constituent component "network applications." Edge suggests—contrary to the specification and knowledge of the POSITA—that a "distributed application" can be any grouping of any number of applications as long as they are in "secure communication" even if they also operate completely independently. Edge's construction thus eliminates all reasonable constraints to the term "distributed application" as it merely

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incorporates other parts of the claim term to be construed and is inconsistent with a POSITA's understanding. Ex. 1, ¶32-34.

The specification further confirms Microsoft's proposal. The distributed application is consistently described as coming in a "package" (*i.e.*, a single piece of software). *See, e.g.*, '871 at Fig. 11, 15:49-57, 18:15-45; *see also* Fig. 7 (showing distributed applications described by single function such as power management). The specification explains that the network device and cloud device applications are part of a single "dApp" (distributed application). When selected for deployment, the dApp is broken down, and its components installed on the network device and cloud device. *See id.* at Fig. 12, 19:17-39. Once installed, the component applications communicate to work together as the original dApp. *Id.* Edge's proposed construction includes the opposite of what the specification teaches; under Edge's proposed construction, a distributed application could be formed from combining any two applications in contrast to separating a single piece of software into multiple components to make a dApp. A POSITA reviewing the specification would thus reject Edge's proposed construction. Ex. 1, ¶32-34.

Edge focuses on the idea of a "sister app," which actually confirms Microsoft's proposed construction. *See* Br. at 4. The sister app according to '871 at 10:29-43 is a component of software on a cloud device that "is paired with" another component on a network device to perform a particular function; the components are co-dependent and function as a single piece of software or a singular executable unit. *See also* '871 at Table 8, row 67 ("once a preset threshold percentage has reached, it messages its sister fxCloudApp which in turn would send a request to the fxDeviceApp to increase or decrease the WAN bandwidth."). The specification explains that sister app fxCloudApp is part of a distributed application (fxApp) package of multiple "software components" including "fxDeviceApp binary; fxCloudApp binary; Manifest files; and

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Signatures." '871 at 10:38-43. A POSITA would thus understand that each of these software components together (of which the "sister app" is one) forms a single piece of software. Indeed, Edge apparently agrees that the distributed application is "formed from multiple components," framing this portion of the construction as something Microsoft "concedes," yet did not add that clarifying language to its proposed alternative construction. Br. at 5.

Microsoft's extrinsic evidence makes clear that an "application" has an intended, user-focused purpose (for example, word processing or accounting), supporting Microsoft's proposed construction. *See* Exs. 4-8; Ex. 1, ¶34. Edge's extrinsic evidence, by contrast, does not clarify the crux of the dispute as it dates to 2021 and appears limited to a "CRR" function that Edge makes no attempt to tie to the disclosures in the patent. Edge's extrinsic evidence does not reflect the understanding of a POSITA at the time of the invention in 2013.[4] Ex. 1, ¶32-34. Thus, "distributed application" is a single piece of software split into multiple components hosted on different devices such that it performs as a single piece of software.

D. "sandboxing operating system" ('871, claims 1, 9; '095, claims 1, 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
software that contains a kernel, connects to hardware resources, and ensures each application runs as a dedicated process in sure isolation from the other applications	plain and ordinary meaning; alternatively, an operating system that runs each application as a dedicated process in sure isolation from other applications

The parties agree that a sandboxing operating system runs each application as a dedicated process in sure isolation from other applications. However, Edge's proposed construction does not help clarify for the factfinder what an "operating system" is and selects only part of the

[4] For the avoidance of doubt, Microsoft's construction does not require the "distributed application" to always be "a single software package," as Edge's brief suggests. Br. at 4. That being said, the specification's repeated discussion of a "distributed application" being saved as a "software package" reinforces Microsoft's proposed construction which requires the "distributed application" to have "a single piece of software" that performs its own function.

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functionality (the isolation) from the definition provided in the specification while excluding that the sandboxing operating system must contain a kernel and connects to hardware resources.

The intrinsic evidence supports Microsoft. The specification expressly terms the sandboxing operating system of the patents as fxOS. '871 at 10:17-19. The patents describe the fxOS as having software layers, with a kernel at the bottom of the stack and various tools above that and where "the kernel also connects to the hardware resources via the device drivers." *See* '871 at 12:1-6, Fig. 4. The specification also references the kernel where fxOS co-exists alongside a general purpose OS; such co-existence "allows reuse of the kernel so there would be no need to re-port the drivers of hardware resources twice." *See* '871 at 13:45-62, Figs. 5-6.

The intrinsic evidence never departs from the notion that a sandboxing operating system contains a kernel which connects to hardware resources. That is consistent with the contemporaneous extrinsic evidence. Numerous technical dictionaries define a kernel as the "central" or "core" part of an operating system. *See* Exs. 6-9, Ex. 5 (also defining operating system as including a kernel). Further, the definitions of "operating system" make clear that it necessarily connects with hardware elements, like a computer. Exs. 4-9; *see also* Ex. 1, ¶36-39. Thus, a POSITA would understand that a sandboxing operating system includes a kernel and connects to hardware resources.

E. "application management portal" (871, claims 1, 7, 9; '095, claims 1, 15; '823, claim 19)

Microsoft's Proposed Construction	Edge's Proposed Construction
a portal for application management having a user interface	portal for the network administrator (admin) to manage the lifecycle of applications

The parties primarily disagree whether a "portal" has a user interface. Edge's contention that a "portal" is nothing more than a general-purpose computer is unsupported and wrong. A POSITA would understand that a portal has a user interface as Microsoft contends.

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Microsoft's proposed construction is consistent with the intrinsic evidence. The specification describes the application management portal as presenting a "*user-friendly* portal to the network administrator" '871 at 10:51-54. A POSITA would understand that the user-friendliness is achieved by allowing the user to configure the network through a user interface. Ex. 1, ¶41-43. The specification also describes buttons and geographic maps as part of the application management portal, which indicate to a POSITA that the portal has a user interface in addition to its substantive functionality for managing network applications. '871 at 16:29-35. Contemporaneous technical dictionaries also support Microsoft's proposed construction. Ex. 6 ("portal" as a website with a graphical user environment); Exs. 7-8 (same); Ex. 4-5 (portal defined as what a user first interfaces with to access other functions).

Notwithstanding the argument it advances in its brief, Edge's construction and extrinsic evidence are consistent with Microsoft's position. Edge's construction describes the application management portal as useful to a "network administrator" to manage applications. A network administrator is a person, and not all network administrators have advanced programming knowledge. Ex. 1, ¶42. However, in a portal without a user interface as Edge urges, advanced coding would be required to manage applications. Thus, Edge's construction is inconsistent and supports Microsoft's position; a network administrator would need a user interface in order to configure the network. Edge's dictionary definition of "portal" describes an example of a portal as a "web portal," *i.e.*, a website, which by its nature will have a user interface and thus also supports Microsoft's construction. *See* Ex. 14; Ex. 1, ¶42-43.

F. "infrastructure application marketplace" ('823, claim 19)

Microsoft's Proposed Construction	Edge's Proposed Construction
an application store with a user interface that presents distributed applications available to the administrator	an application repository presenting tested and certified applications

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Microsoft's proposed construction provides the appropriate clarity to the jury and is true to the intrinsic evidence, while Edge's conflates the term with other limitations and functions.

The parties disagree about whether the marketplace is akin to a store. Edge wrongly suggests the use of "store" is confusing when it is the patentee who specifically chose to refer to the infrastructure application marketplace as "fxStore" in the specification. The specification describes "an infrastructure application market place (fxStore) 308." '871 at 10:13-17. Figure 7 provides a view of the "fxStore Portal" from which an admin can "procure the applications [from] a third party application store (fxStore)" and "which presents all the tested and certified vApps as well as showing the supported fxOS version, support hardware platforms, and other information such as reviews and number of commercial deployments by all NOIT customers." '871 at 10:54-59, 16:39-46. In other words, the infrastructure application marketplace in the context of the patent is an application store with a user interface that shows the network administrator various categories of information about the applications.

Edge's proposed construction is contrary to the plain language of the claim in the context of other related claims. The patentee used "application repository" in the claims of the related '871, but chose to use a different term, "infrastructure application marketplace," in claim 19 of the '823. The specification similarly distinguishes between them since, though they work together, they perform different functions; applications are downloaded from the infrastructure application marketplace into the application repository. *See* '871 at 10:15-17, 15:49-53 (describing "infrastructure application marketplace" as fxStore and "application repository" as "AR."); *see also* 18:60-62 ("These applications are already downloaded (from the fxStore or other sources) into the Application Repository (AR)."); *see* §B (*PPC Broadband)*. The term thus must mean something other than "application repository" as Edge urges.

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The parties also disagree about whether the application store presents "applications" generally (Edge's proposal) or "distributed applications" (Microsoft's proposal). The patent describes fxStore as presenting fxApps, dApps, and vApps. '871 at 10:54-59 (fxApps, vApps); 18:57-62 (dApps). Each of those Apps are defined to be distributed applications having multiple components, including at least an fxDeviceApp component and an fxCloudApp component. '871 at 10:33-43 (fxApps, dApps), 30:20-27, Table 8 (dApps, vApps). There are no descriptions of Apps that are not distributed applications. Thus, Microsoft's proposed construction as presenting distributed applications is the one that is supported by the intrinsic evidence.

G. "affect change" ('871, claim 7)

The parties agree that "affect change" should be construed as "effect change."

H. "programmable network device processing data flows hosting at least one of a plurality of first network applications" ('871, claim 9; '095, claim 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
programmable network device for processing data flows and hosting at least one of a plurality of first network applications	No construction necessary

Microsoft's proposed construction is intended to clarify that the programmable network device processes data flows *and* hosts applications. Data flows do not host applications. Absent Microsoft's proposal, the claim term would not make sense to a POSITA. The word "for" corrects a grammatical error; the term "programmable network device processing data flows" absent the word "for" does not make sense to a layman or a POSITA. Ex. 1, ¶44-45.

II. INDEFINITE AND MEANS-PLUS-FUNCTION CLAIM TERMS

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.,* 572 U.S. 898, 901 (2014). The standard "must provide objective boundaries for those of skill in the

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art." *Interval Licensing LLC v. AOL, Inc.,* 766 F.3d 1364, 1371 (Fed. Cir. 2014); *U.S. Well Servs., Inc. v. Halliburton Co.,* No. 6:21-CV-00367-ADA, 2022 WL 819548, at *4 (W.D. Tex. Jan. 17, 2022). When a term of degree is used in a claim, "the court must determine whether the patent provides some standard for measuring that degree." *Biosig Instruments, Inc. v. Nautilus, Inc.,* 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted).

Under § 112(f)[5] (means-plus-function), the "scope of coverage" of a functional term without sufficiently definite structure (such as a "nonce" word that is "nothing more than verbal construct[]") is restricted to the "structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347, 1350 (Fed. Cir. 2015) (en banc) ("*Williamson*"). This may include disclosure of an "algorithm," for example, as "expressed as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure" in the specification. *Id.* at 1352. The intrinsic evidence discloses sufficient structure if it "clearly links or associates that structure to the function recited in the claim." *Id.* Thus, "if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim, a means-plus-function clause is indefinite." *Id*.

I. "virtual fabric" ('871, claims 1, 9)

Microsoft's Proposed Construction	Edge's Proposed Construction
indefinite	an abstraction layer for applications to communicate with each other

The term "virtual fabric" is indefinite because "fabric" is a generic, nonce word made even more vague through the addition of "virtual." Intrinsic evidence in the prosecution history confirms that this term should be considered a means-plus-function term. Ex. 12 at 10, 12-16, 48.

[5] Prior to the implementation of the AIA, this doctrine was known as § 112, ¶ 6. The AIA did not change the substance of the doctrine.

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As a purely functional nonce term, it is indefinite unless the specification connotes sufficient algorithm or structure according to *Williamson*. Here, it does not.

Edge attempts to propose a construction based on the specification's vague description of "virtual fabric (fxVF)." Br. at 9. But its proposed construction of "an abstraction layer for applications to communicate with each other" is itself functional and undefined in scope. As Dr. Weissman explained, in networking, anything can be an abstraction of something below or above it since "abstraction" simply means hiding complexities that do not need to be visible and an "abstraction layer" does not provide meaningful structure to a POSITA. Ex. 1, ¶47-52. All descriptions of a "virtual fabric" in the specification are functional, for example, references to an undefined software that enables communication between components of a distributed application. '871 at 11:62-67. This is again more vague and undefined functional language. Thus, a POSITA would not be able to determine if its particular network architecture contains a "virtual fabric" and the replacement with the term "an abstraction layer" remains indefinite.

Further, the specification does not explain, and a POSITA would not understand with any degree of certainty, what the complexities are that should be hidden based on the claim language or how to achieve that. Instead, it is described by reference to function and vague, undefined amounts of abstraction—that the abstraction layer "hides most of the complexities of messaging from the developers." '871 at 13:39-45. Thus, the term renders the associated claims indefinite.

J. "the programmable network device and programmable cloud device are each powered by a sandboxing operating system which facilitates deployment of the plurality of first and second network applications" ('871, claims 1, 9; '095, claims 1, 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
indefinite	plain and ordinary meaning; alternatively, the programmable cloud device and the programmable network device each having a sandboxing operating system allowing applications

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	to run and interact with resources on the respective device

This term is indefinite based on its use of two phrases—"powered by" and "facilitates deployment" —that are generic to a POSITA yet not appropriately clarified in the specification.

As explained by Dr. Weissman, "powered by" is a marketing term that generally conveys software; it has no meaning to a POSITA from a technical perspective. Ex. 1, ¶54-55. And the specification does not use "powered by" other than to merely parrot the claim language; it does not provide any certainty on how or if an operating system "powers" devices. Further, it is not clear to a POSITA the same "sandboxing operating system" powers both the "programmable network device" and "programmable cloud device" and which "facilitates deployment" of the applications. *Id*. at ¶56-59. The excerpts of the specification Edge points to in order to support its alternative construction simply outline various functions of the sandboxing operating system and do not provide any clarifying meaning to "powered by." Br. at 11 (citing cols. 10-11 of the '871).

Further, there is no disclosure in the specification of a "cloud device" having a sandboxing operating system, certainly not being "powered by" one. However, under Edge's construction of the fxCloud as the "cloud device" (which Microsoft disagrees with, as discussed above), Figures 8-10 show that this term is indefinite. Each figure shows *three* operating systems on the fxCloud, leaving a POSITA unsure about how many "sandboxing operating systems" a cloud device may have, and which of the three is the "sandboxing operating system" that is supposed to be performing the claimed functions. Ex. 1, ¶55-56. The sections Edge points to in its brief only describe functions of the fxDevice and fxCloud generally, without clarifying the meaning of "powered by." *See* Br. 11-12

The scope of the term "facilitates deployment" is similarly unclear to a POSITA. Ex. 1, ¶57-59. The specification never discusses the concept of facilitating in the context of operating

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systems or deployment of applications. The specification only uses the term "facilitates" in the context of a flexible Software Development Kit (fxSDK), which is not an element of any of the asserted claims and is not tied to the function of the sandboxing operating system. '871 at 16:50-17:13. Thus, the term renders the associated claims indefinite.

K. "[managing/facilitates] upgrades of the first and second network applications with substantially no interruption to operation of the programmable network device and programmable cloud device" ('871, claims 1, 9; '095, claims 1, 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
indefinite	having at least one instance of the application running during the upgrade

This claim term is indefinite because the specification fails to explain what it means to upgrade applications with "substantially no interruption" to the device's operation. As explained by Dr. Weissman, a POSITA would not understand the scope of this claim term. Ex. 1, ¶61-68.

The specification provides no guidance as to objective boundaries to apply to define what is "substantial" or not. Edge's argument that "substantially" is not indefinite because it was given plain and ordinary meanings in unrelated cases (Br. 12) misses the mark. Not only is it contrary to the well-established principle that a patent term "need not have the same meaning when used in an entirely separate patent, particularly one involving different technology" (*see, e.g., Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1318 (Fed. Cir. 2005)), but those cases all found more clarity in the intrinsic evidence than exists here, and they pre-date the applicable law governing indefiniteness and subsequent Federal Circuit cases applying *Nautilus* in the context of terms of degree such as "substantially." Indeed, "terms of degree render a claim indefinite where the intrinsic evidence (or extrinsic evidence, where relevant and available) provides insufficient guidance as to any objective boundaries for the claims—including where the claims are 'purely subjective' such that their scope cannot be determined with reasonable certainty." *Niazi*

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Licensing Corp. v. St. Jude Med. S.C., Inc., 30 F.4th 1339, 1348 (Fed. Cir. 2022).

Applying this standard, the specification and prosecution histories fail to outline the objective boundaries for the claim term. The specification only repeats that the fxOS "allows hot upgrade of the software and applications on the platform with little to no interruption to the operational aspect of the platform and its application" without explaining how this function is achieved or what degree of interruption is permissible and from what perspective. '871 at 11:34-37. It remains purely subjective such that a POSITA cannot determine the scope with reasonable certainty. Ex. 1, ¶61-68. Case law in this district and others makes clear that this is insufficient guidance. *Clear Imaging Rsch., LLC v. Samsung Elecs. Co.*, No. 2:19-CV-00326-JRG, 2020 WL 6384731, at *20 (E.D. Tex. Oct. 30, 2020); *Brazabra Corp. v. Ce Soir Lingerie Co.*, No. 1:18-CV-683-RP, 2019 WL 13136348, at *7 (W.D. Tex. Aug. 15, 2019)).[6]

The claim term is also indefinite independent of the use of the word "substantially" because it leaves uncertainty as to the perspective and types of interruptions that would be implicated. The specification does not explain what constitutes an "interruption" (such as latency, degradation, downtime) or whose vantage point the interruption would be from (such as user, network administrator, or layers of the system itself). Thus, a POSITA would be left to guess as to the scope and meaning of the claim term. Ex. 1, ¶61-68.

Edge concedes that the term is a § 112(f) term under *Williamson*, thus limiting the term to the structure described in the specification (if any) and rendering the claim indefinite if a POSITA cannot recognize and associate the structure with the corresponding function. Br. at 12-

[6] As Dr. Weissman explained, "substantially no interruption" does not merely account for the notion that no interruption is possible. Ex. 1 at ¶ 67. *See Fairfield Indus. v. Wireless Seismic, Inc.*, No. 4:14-CV-2972, 2015 WL 1034275, at *16 (S.D. Tex. Mar. 10, 2015) (holding that "substantially" rendered a claim term indefinite where there were no objective boundaries and the term did "not serve to acknowledge a physical impossibility or imprecision").

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13. Edge's proposed construction of "having at least one instance of the application running during the upgrade" is inappropriate; the phrase is never used in the specification,[7] and there is nothing in the specification linking the general "hot upgrade" procedure Edge points to with the notion of managing upgrades with "substantially no interruption." Thus, Edge's proposed construction should be rejected and the claims incorporating the term should be found indefinite.

L. "unique security keys associated with each of the plurality of first and second network applications" ('871, claims 1, 9; '095, claims 1, 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
indefinite	plain and ordinary meaning

The plain language of this claim term renders the scope of the limitation unclear to a POSITA. It is unclear to a POSITA from reading the claim which of at least five possible permutations this term intends to convey. As Dr. Weissman explained, the term has at least five potential meanings to a POSITA. Ex. 1, ¶70-71.

The specification, including portions cited by Edge (Br. at 15), does not clarify the scope or application of "unique security keys" in any way. The specification's general discussion that "applications may be signed with unique certificate security keys" and "network elements should have unique identities" does not clarify the scope of the claim term. '871 at 11:29-34, 22:49-23:7, 23:23-38. Other disclosures in the specification, such as the concept of a "shared secret key" support Dr. Weissman's perspective that a POSITA would not know whether the network applications should share a unique key, or have different unique keys. *Id.* at 23:39-24:12. Thus, this term fails to inform a POSITA with reasonable certainty about the scope of the invention. Ex. 1, ¶70-73. Edge's proposal to revert to the plain and ordinary meaning, without explaining what that meaning is, does not suffice to resolve the parties' dispute. *O2 Micro Int'l Ltd. v.*

[7] Edge's proposed construction should also be rejected as an improper application of § 112(f) because it does not import the language from the specification into the construction.

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Beyond Innovation Tech. Co., Ltd., 521 F.3d 1351, 1360–61 (Fed. Cir. 2008).

M. "the application management portal [further] manages usage of the distributed applications…" / "the application management portal [further] manages provisioning, usage and de-provisioning of the distributed applications..." ('871, claims 1, 9; '095, claims 1, 15)

Microsoft's Proposed Construction	Edge's Proposed Construction
indefinite	ensuring availability of sufficient resources; provisioning and deprovisioning have plain and ordinary meaning of deploying and terminating instances of an application

Edge again concedes that this term is a § 112(f) term under *Williamson*. Br. at 15-16. As an initial matter, Edge's proposed construction should be rejected because it does not import the language of the alleged "algorithm" from the specification into the construction (*see* 35 U.S.C. § 112(f)) and because it is mere functional language that does not connote any associated structure. *Williamson* at 1352. Further, Edge's proposed construction does not reflect the plain meaning and Edge has not and cannot find support for it in the specification. Ex. 1, ¶75-81.

Fundamentally, the alleged "algorithm" Edge points to in the specification is insufficient to connote structure to a POSITA. The portions of the specification cited by Edge focus on an "analysis tool" to "discover . . . usage platform resources" and do not explain at all what it means for the application management portal to actually manage the usage of the distributed applications as described in the claim. Br. at 15 (citing '871 at 18:65-19:7). Nor is "using information available within a secure manifest file and elsewhere to ensure the availability of sufficient resources" (Br. at 15) the disclosure of a sufficient algorithm because it does not give a POSITA certainty as to *how* such information should be used by the application management portal to manage usage or *how* the function of ensuring availability of resources is achieved. *See Williamson* at 1352. A POSITA would not be able to recognize the structure in the specification and thus the asserted claims incorporating this term are indefinite. Ex. 1, ¶76-77.

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It is similarly unclear to a POSITA from the plain language of the claim how the claimed "application management portal" would manage usage of distributed applications. Instead, a POSITA would understand that the portal itself is for the network administrator to configure the network; the portal does not directly "use" applications at all. As Dr. Weissman explains, if the portal manages a distributed application, it means the portal must act as supervisor of every part of the distributed app all over the Internet. Ex. 1, ¶77. The specification does not explain how to achieve this at all, if it is even possible. Thus, this term renders the associated claims indefinite because it fails to inform a POSITA with reasonably certainty about the scope of the invention.

N. "a second programmable network device which includes the at least one of the plurality of first network applications which is in the first programmable network device" ('871, claim 4; '095, claim 7)

Microsoft withdraws this based on the apparent meaning that Edge ascribes to the term.

O. "load controller adapted to monitor loads" ('871, claim 7)

Microsoft's Proposed Construction	Edge's Proposed Construction
means plus function term; indefinite	a controller executing at least one of a "cloud breathing" or "load monitoring" application

The parties agree that this term is a § 112(f) term, thus limiting the term to the structure described in the specification (if any) and rendering the claim indefinite if a POSITA cannot recognize and associate the structure with the corresponding function. Br. at 16-17.

Claim 7 recites "a load controller adapted to [1] monitor loads on the programmable network device and the programmable cloud device and [2] affect change in accordance with thresholds received from the application management portal." Edge's proposal essentially collapses the two parts of claim 7 into one, reading out the "adapted to monitor loads" portion. Edge contends the disputed term encompasses "cloud breathing," which is a mechanism by which resources are expanded or reduced *based on the load.* Br. at 18; '871 at 22:23-39. This is incorrect, as a POSITA would understand that "cloud breathing" is different from "load

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monitoring" and would thus associate the portions of the specification regarding "cloud breathing" with the second "effect change" clause, not the "monitor loads" clause. Ex. 1, ¶83-85.

Edge urges that the specification discloses an "algorithm," citing to the '871 at 22:10-39. Br. at 17-18. But focusing on the "load monitor" function, the specification does not disclose the necessary algorithm. An algorithm must "provid[e] some detail about the means to accomplish the function," and cannot "simply describe[ ] the function to be performed." *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1340–41 (Fed. Cir. 2008); *Williamson* at 1352. The specification states "a load monitoring application could be notified when the CPU load on a particular fxDevice (or a target area) exceeds a certain threshold. In turn, such an exemplary application could make smart decisions on reducing the load on the CPU by forcing handoffs . . ." but this only describes functions and does not describe, *e.g.*, *how* the load monitor gets such a notification, sets a threshold, or makes smart decisions.

Edge also points to the flow charts shown in Figs. 17A-B as the structure, but this falls short of an algorithm. Br. at 19. To connote sufficient structure, flow charts cannot merely re-provide the claimed functions, they must describe how the claimed function is performed or how to achieve the results as required under Federal Circuit law. *See Function Media, L.L.C. v. Google, Inc.*, 708 F.3d 1310, 1318 (Fed. Cir. 2013) (flow charts insufficient where lines and boxes merely represented the claimed transmission and did not show "how the software performs the transmission function"). The reference to the "monitor loads" step in the figures is a box with no associated explanations. Thus, a POSITA would be unable to discern an algorithm associated with the load monitoring function from the specification. Ex. 1, ¶85-86.

P. "where each of the network device applications can communicate directly" ('823, claim 13)

Microsoft withdraws this based on the apparent meaning that Edge ascribes to the term.

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CERTIFICATE OF SERVICE

I, the undersigned, do hereby certify that a true and correct copy of the foregoing document is being served on January 17, 2025 by electronic mail on opposing counsel of record.

/s/ Irene Yang
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