UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

AI VISUALIZE, INC. Plaintiff, v. NUANCE COMMUNICATIONS INC. and MACH7 TECHNOLOGIES, INC., Defendants.	: : : : : : : : :	C.A. No. 1:21-cv-01458-CFC JURY TRIAL DEMANDED

PLAINTIFF AI VISUALIZE'S FIRST AMENDED[1] COMPLAINT

Plaintiff AI Visualize, Inc. ("Plaintiff") files this First Amended Complaint for Patent Infringement against Defendants Nuance Communications Inc. ("Nuance") and Mach7 Technologies, Inc. ("Mach7") (collectively, "Defendants"), and states as follows:

I. THE PARTIES

1. Plaintiff is a Texas corporation having its principal office at 101 E. Park Blvd., Suite 600, Plano, Texas 75074.

2. Plaintiff owns the Asserted Patents and holds all rights necessary to bring this action.

3. Upon information and belief, Defendant Nuance Communications, Inc. is a company organized and existing under the laws of the State of Delaware, with a principal place of business at 1 Wayside Road, Burlington, MA 01803.

4. Upon information and belief, Defendant Mach7 Technologies, Inc. is a company organized and existing under the laws of the State of Delaware, with a principal place of business at 120 Kimball Avenue, Suite 210 South Burlington, VT 05403.

[1] A redline reflecting changes from the original Complaint is attached as Exhibit A.

II. JURISDICTION AND VENUE

5. This Court has exclusive subject matter jurisdiction over this case pursuant to 28 U.S.C. §§ 1331 and 1338(a) on the grounds that this action arises under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq*., including, without limitation, 35 U.S.C. §§ 271, 281, 284, and 285.

6. This Court has personal jurisdiction over the Delaware Defendants because they have minimum contacts with the State of Delaware, have organized as a Delaware entity, and have purposefully availed themselves of the privileges and laws of the State of Delaware.

7. Venue is proper in this Court pursuant to 28 U.S.C. § 1400(b) at least because Defendants are incorporated in, and therefore reside in, the State of Delaware.

III. FACTUAL BACKGROUND

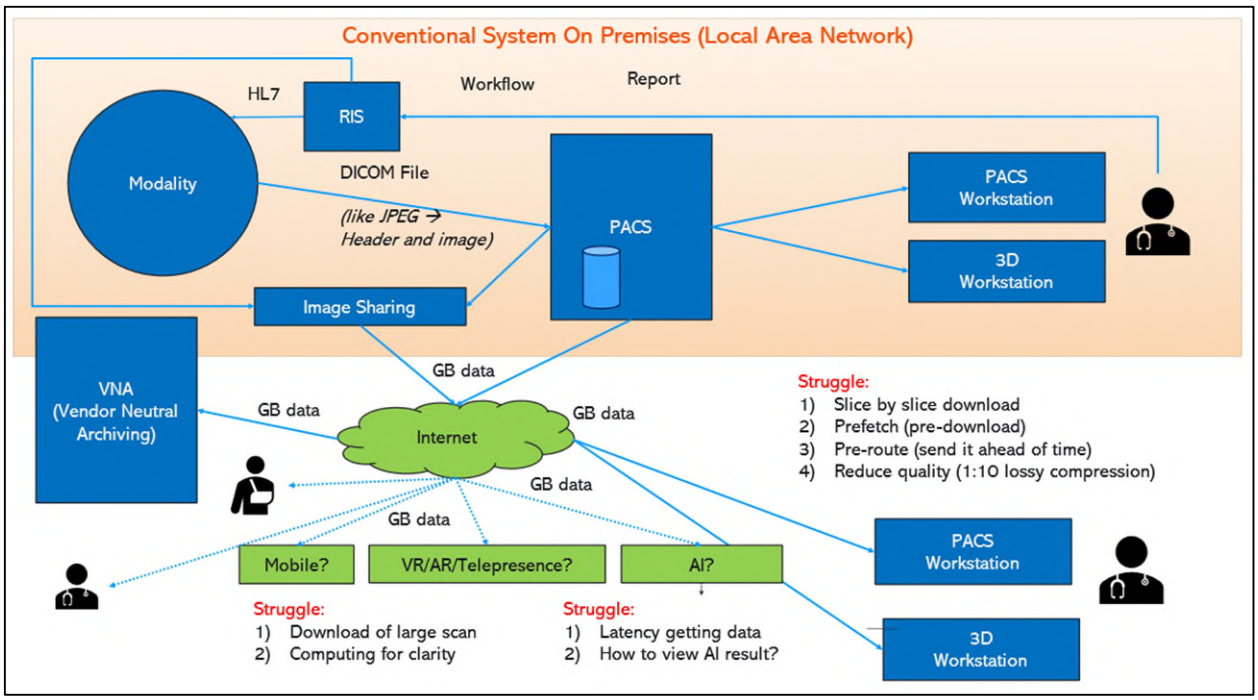
A. AI Visualize

8. Plaintiff AI Visualize, Inc. and its technology enable a HIPAA-compliant, proprietary platform for cloud infrastructure and AI Visualization, which empowers healthcare organizations, data scientists, and AI practitioners to leverage the power of AI for improved workflow management, research initiatives, and patient outcomes.

9. Plaintiff's FDA-cleared technology has been validated in the market and has been shown to be revenue producing and profitable. Replacing antiquated on-premises systems, Plaintiff's technology has been shown to enhance access, speed, and clarity of medical imaging data, while reducing hospital costs up to 85% per study. This is done with reduced complexity for healthcare providers, who no longer own or license hardware or software and instead use decentralized or cloud services on a pay-per-use basis using just a web browser.

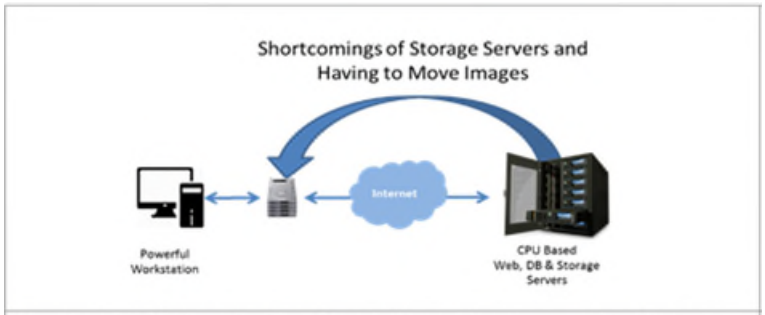
10. For example, conventional on premises solutions require ownership and

maintenance of a number of interconnected hardware and software systems on a local network, which also complicates accessibility and authorization for remote users and third parties.



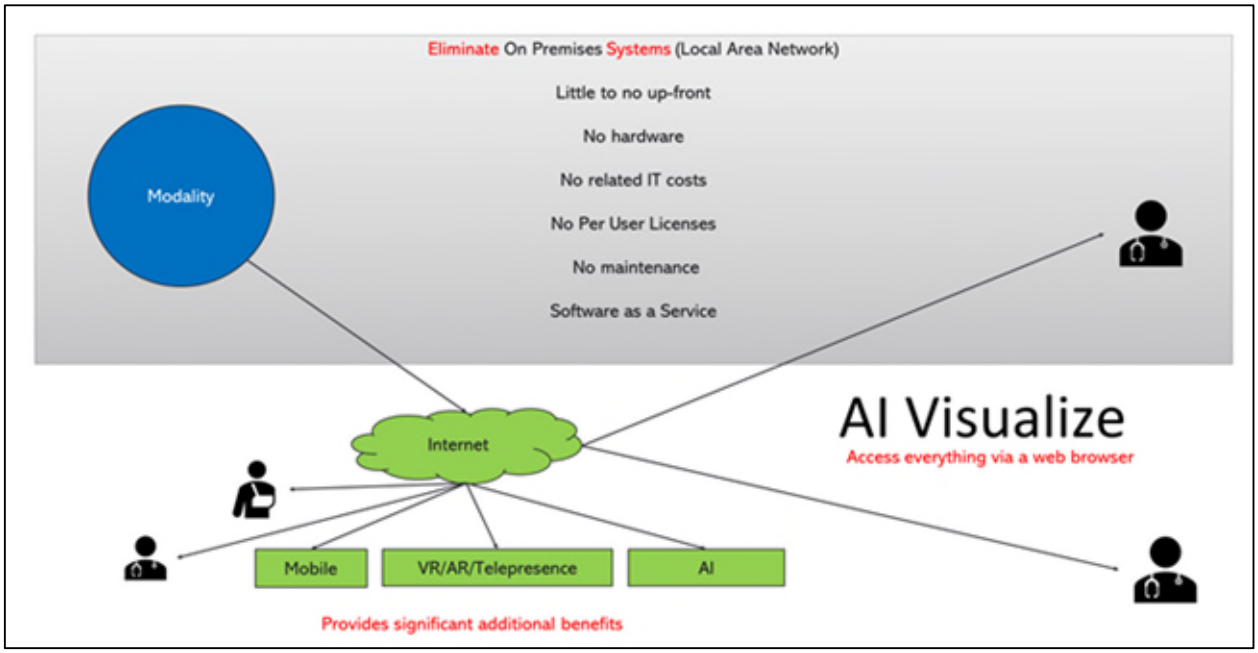
11. Many hospitals today still have their data siloed, and this is a leading cause for high misdiagnosis and about $27B in wasted expenditure annually from rescanning patients. Rescanning patients often occurs when patients move from one facility to another, leading to poor patient outcome and unnecessary radiation exposure to patients.

12. Additionally, there are a number of recognized technical shortcomings of other conventional systems that depend on powerful workstations to receive and process transmitted patient data over the internet.

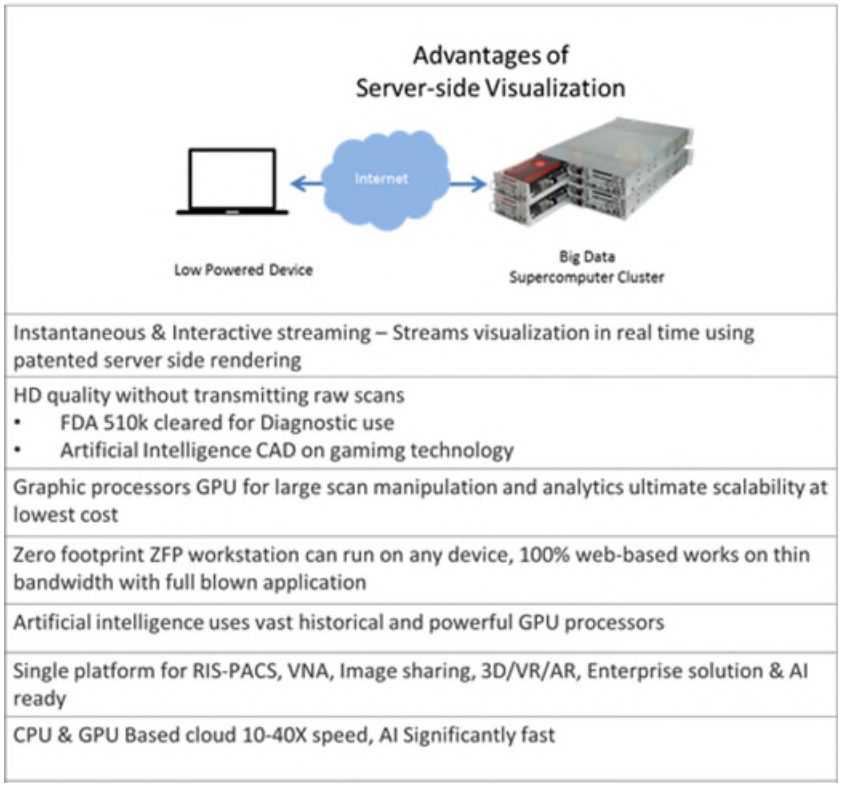


Download data before viewing - Slow and transmits raw scans to end users
Compromises image quality of raw scans for faster transmission • Not fit for diagnosis • Computer Aided Diagnosis Inaccurate
Storage servers cannot manipulate or analyse large data additional compute servers are expensive – not a scalable solution
Powerful expensive PC workstation to run clinical apps. Remote access with limited functionality
Machine learning (AI) lack breadth of data and processing power
No Single vendor capable of multiple applications, Expensive proposition
CPU based 1X speed , Slow AI apps

13. In contrast, Plaintiff's technology provides a seamless solution for replacing antiquated on premises solutions while still providing secure, fast access to diagnostic quality medical imaging information on any device, anywhere.



14. Additionally, utilizing Plaintiff's patented technology provides a number of technical advantages associated with server-side visualization.



15. In particular, Plaintiff's technology delivers a holistic approach to solving medical imaging community problems by simultaneously addressing PACS, RIS, image sharing, VNA, enterprise imaging, 3D/VR/AR, and AI needs. Key features include:

- delivering zero-latency intelligent views interactively over the internet
- preventing patient privacy breaches by avoiding transmission of patient data
- facilitating FDA cleared tools for physicians to create and review findings
- enabling collaboration among physicians and patients
- delivering real-time immersive 3D interactive VR telepresence
- managing end-to-end workflow for a medical imaging practice
- executing machine learning algorithms to provide data intelligence

- conducting research in deep learning classification and disease detection
- giving patients control for obtaining treatment and seeking second opinions

16. Plaintiff's technology provides diagnostic quality use and benefits for a number of healthcare fields, including radiology, cardiology, oncology, orthopedics, and stroke care.

17. Plaintiff's platform provides a PACS/RIS solution with imaging sharing, vendor neutral archiving, telepresence, 3D/4D/VR/AR/XR visualization, Artificial Intelligence (AI) accessible on any device, and scalable proprietary cloud computing platform. Plaintiff's platform also provides additional benefits of adaptive visualization, interactive streaming, scalability without latency and bandwidth impacts, geographically distributed computing using blockchain, big data supercomputing, and an AI application marketplace.

18. At the time of the invention, the concept of cloud computing was generally considered inapplicable to healthcare due to privacy issues. Plaintiff's patented technology focuses on a solution where medical imaging can be hosted securely away from the hospital premises, and importantly without losing the viewing performance that physicians are used to with an on-site system. This performance is delivered, while also avoiding the transmission of the raw data over the Internet.

19. Plaintiff's platform also provides secure storage for analysis and viewing of medical imaging data on any device using just a web browser. This further supports telepresence and on-demand, real-time access to specialists, as well as AI applications integrated with and augmenting practitioner workflow using self-curated data of physicians' findings via textual description, image annotations, and workflow.

20. In comparison, conventional artificial intelligence solutions are not integrated into the workflow of physicians or other healthcare stakeholders, are not cost effective, and require

substantial investment for each AI application to be developed, integrated, and deployed for healthcare providers. Healthcare providers typically have to absorb this large cost of investment for each and every AI application. This makes adoption of new AI applications impractical.

21. Conventional cloud storage solutions are recognized to be problematic with latency-sensitive applications. Conventional cloud storage solutions have typically been developed for long term data storage, not for instantaneous interactivity or AI. Bringing intelligent latency-sensitive applications to market on those systems presents development, performance, and cost challenges as a result. Plaintiff's patented technology delivers a solution to these by offering a platform for interactive visualization and artificial intelligence using a web browser on any device.

22. Plaintiff continues incubating use cases for its patented platform, including in industries such as healthcare, architectural, cloud gaming, retail, brand, advertisement, and oil and gas. Plaintiff's vision is to develop its proprietary and patented platform to provide intelligent visualization on any device; the ability for latency-sensitive AI and visualization applications to be developed swiftly and delivered to mainstream quicker at an affordable cost structure for application developers and consumers alike. This is done by facilitating application programming interface development to speed up latency-sensitive applications and provide computing power to execute such applications at an affordable cost. Development and deployment of AI and visualization applications are greatly accelerated since the applications need only a web browser on any device. These applications, developed by Plaintiff or by third parties under a license, would then be available on an AI and Visualization marketplace.

B. Recognized Problems in the Field of the Inventions and Background of the Technology

23. Generally, demand for easy access to medical scans is increasing and the

expectation for a simpler and faster way to interpret these large scans is growing.

24. Technology exists to present richer three-dimensional (3D) views from existing two-dimensional (2D) scans that may lead to better diagnosis and prognosis as well as improved patient care. However, the current solutions are impractical for 3D to be ubiquitous.

25. Computed Axial Tomography (CT) scans or magnetic resonance imaging (MRI) scans of a patient's body results in large 3D volume datasets that is time consuming when transported over the Internet.

26. The scans are typically spaced two-dimensional planar cross-sections of the patient's body or a portion thereof, such as an organ. The scans of these or other objects may be stored as a volume visualization dataset in an otherwise conventional data storage medium accessible by a computer or other specialized processor.

27. Assuming the scans are parallel images arranged in the sequence in which they are found in the scanned object, 3D virtual views of the volume visualization dataset are made by selecting a plane to be cut through the volume of the object at a particular location and angle.

28. The selected plane may be parallel to the scans, or at any angle to the scans. The location may be anywhere within the scanned volume of the object.

29. The 3D virtual image is a two-dimensional representation of the 3D object showing the desired perspective of view and may include images showing depth of or through the object in a direction normal to and behind the selected plane of view. Generating dynamic 3D views requires processing of raw 2D scans in to 3D and to isolate feature of interest from the raw scan.

30. The user may also request arbitrarily and dynamically generated views. Historically, this requirement meant that raw scan data needed to be present on the user's

computer for manipulation.

31. Internet access via a web portal in particularly low bandwidth and high latency situation of rural area can hinder the user interactivity of information presented in 3D. Latency, *i.e.*, delay in the time it takes for a packet of data to travel from one designated point to another in response to a request, is particularly problematic for users having low bandwidth Internet communication.

32. For large 3D, four-dimensional (4D), or higher dimensional scans, the retrieving or raw scan for processing is impractical or impossible over low bandwidth network. Furthermore, scans in 4D can come in the form of time varying 3D scans, or as a result of combining two datasets, such as PET and CT scanners dataset combined in one. Also, when PET-CT are combined and have a time component, this can be termed a 5D scan, which involves very large datasets.

33. Furthermore, medical service providers are required to keep medical records for six years or more and have to do so with utmost security and privacy. This becomes expensive and adds a management burden to facilities as there can be IT, physical space and cost administration limitations.

34. Therefore, for 3D to be available, either the user's computer or a dedicated server needs to be powerful enough to support this processing power and the 2D scans need to be directly available to the user's computer via a high speed communication link. Facilities such as Hospitals and Imaging Centers need to provide the software, hardware, and networking infrastructure and support the IT administration to allow their physicians access to 3D. This becomes expensive and adds an administrative burden.

35. Technical difficulties include the following:

- rendering images at a high frame rate through web browser technology at the time of the invention
- interactive streaming and sending dynamic content on demand
- data security with a secure storage site and server-to-client communications.

36. Conventional solutions to try to provide remote access to on-premises PACS/RIS systems encounter problems involving the need to download large data sets, address latency and bandwidth limitations, and provide costly local computing resources to render with sufficient clarity.

37. The asserted patents also discuss limitations to known prior art techniques that are solved by the disclosed inventions, including that the prior art techniques require sufficient bandwidth and low latency network to present information at interactive frame rates, in particular, gaining interactive access to medical scans in advanced visualization formats in low bandwidth situations (e.g., communication speeds of no more than about 1.5 Mbps).

38. Additionally, security, privacy, and records retention requirements all add to the expense, burdens, and limitations encountered by prior art known techniques. These prior art techniques also involve trade-offs with accessibility, portability, security, sufficient bandwidth, latency and interactivity.

39. Additionally, upon information and belief, a tremendous amount of unnecessary medical imaging occurs in the healthcare industry, at significant cost and impact to patients and healthcare providers:

> Approximately one-third of all medical imaging is unnecessary, costing the healthcare industry approximately $26 billion annually. Besides being expensive and often non-reimbursable, unnecessary imaging exposes patients to undue radiation and delays care.

> If a critical stroke patient has to wait for a CD of their imaging before being transferred from a local community hospital to an academic medical center, then that CD winds up misplaced or unreadable, another set of scans will inevitably be ordered. This unnecessary delay in time to treatment significantly compromises patient care and jeopardizes their chance at the best possible outcome.
>
> Furthermore, it is estimated that facilities that receive an average of 500 stroke transfer patients per year could save as much as $500,000 annually and accelerate patient care by harnessing the power of cloud-based image sharing to significantly reduce rescan rates.
>
> Exhibit 2.6; *see also* Exhibit 2.7.

40. Upon information and belief, there are recognized challenges to interoperability across healthcare enterprises and systems that arise from differing proprietary formats and patchworks of providers:

> Complete interoperability enables multiple medical systems and databases to connect with one another, regardless of whether their patient data is stored in the cloud, in a VNA or a PACS system. Unfortunately, the current state in healthcare enterprises is not this simple. If a physician wants to access pertinent information, they frequently need to do so in multiple systems, which contain patient records. This causes the physician to waste an enormous amount of time logging in and out of each system. The problem is amplified when the practitioner must search for images or records in a different facility that is geographically removed from their own.
>
> To overcome this situation, your enterprise viewer must have the ability to fit within the current IT environment, leveraging current systems and integrate with your PACS, VNA or EMR without having to duplicate or move data throughout the enterprise.
>
> Exhibit 3.13

41. Additionally, upon information and belief, those challenges facing the healthcare industry include limitations to readily accessing patient information:

> The biggest challenges in accessing images
> Images stored in many different systems Images and reports are regularly stored in multiple PACS, from multiple vendors and additional information is being loaded into VNAs and EMRs where patients' digital charts live. Many of these

> systems have unique storage structures, so users are left dealing with a wide range of stand-alone interfaces.
>
> Multiple image viewer
> Many archives have different viewers or applications to access images. This makes it difficult on a user because they are required to learn multiple interfaces.
>
> Fragmented access
> Users may not have access to a particular system and they would be required to call another department or clinic to access the information. Clinicians believe that better exchange of health information would have a positive impact on healthcare; however, the lack of an exchange structure is a major barrier to information sharing.
>
> Physically moving and reconciling data There are a large number of files being physically moved or copied unnecessarily. This significantly increases the amount of time it takes to access images and poses a huge security risk.
>
> Exhibit 3.13

42. Upon information and belief, fragmented access to data and requiring physical transport of patient information increases costs and delay, as described below:

> The time associated with users managing multiple interfaces, having fragmented access and physically moving data, equates to significant costs to the healthcare system. There is also the opportunity cost to service-based healthcare organizations that do not have the right systems in place to access information quickly. As a result, referring physicians might be reluctant to send patients to them.
>
> Exhibit 3.13

43. Upon information and belief, the difficulties and time lost from manual transmission of patient information are depicted below:

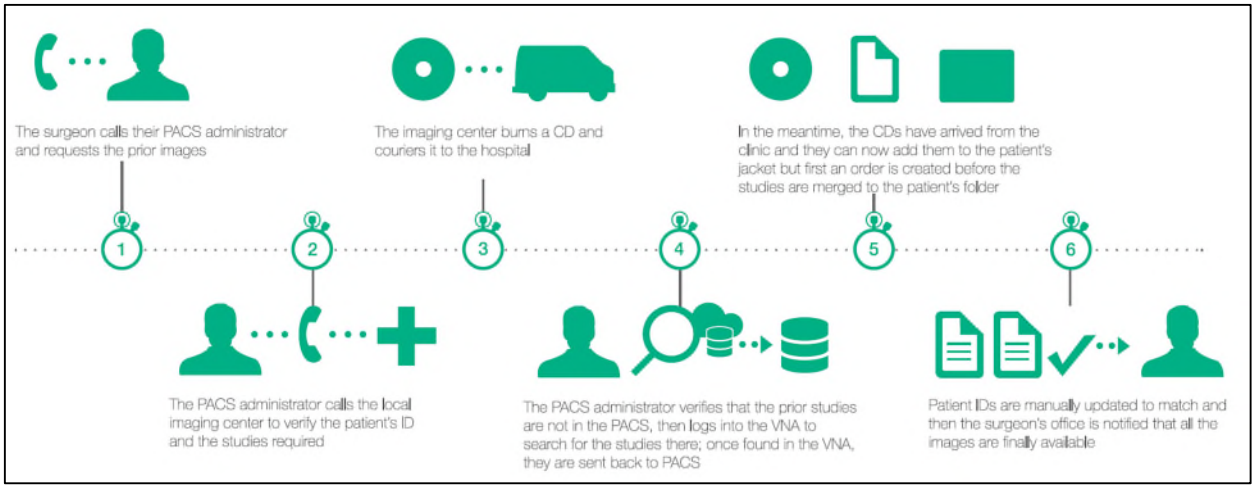


Exhibit 3.13

44. Upon information and belief, the healthcare industry has faced a number of challenges trying to improve PACS technology and patient care:

> The healthcare industry today has a big challenge: linking the various independent departmental systems that can be found throughout the enterprise. Picture Archiving and Communications Systems (PACS) were undoubtedly a huge leap forward as they helped to digitize medical records, however as the technology has matured, its shortcomings have become clear. PACS were not designed to support modern care delivery. Their locked down, legacy technology makes it difficult–if not impossible–to fully leverage innovative technologies and novel strategies to improve outcomes, drive quality, and accelerate growth. Without a bridge from incumbent imaging systems, many organizations have found their digital transformation held captive. Many vendors have tried to address this by adapting their existing systems, but this approach is not good enough to solve the complex issues organizations face today.
>
> …
>
> Increasing Resource Costs
> The need to maintain several different data archives and viewers puts a higher burden on the IT architecture of healthcare facilities. Besides installing and maintaining hardware, IT teams are overwhelmed with maintaining complex software updates and downloads for multiple systems. This is causing the total cost of ownership to soar for many organizations.
>
> Limited Data Access
> Until this point, data archives in healthcare facilities have stood alone and have not promoted easy cross-departmental sharing of information. Without a full patient record, it is much more difficult to get an accurate and timely diagnosis

> and prescribe treatment. VNAs help, but most do not provide the ability to integrate to any system in the enterprise, regardless of origin.
>
> Multiple Viewers to Manage
> Up to this point, physicians, radiologists, and specialists have needed their own specialized viewers to view and interpret patient studies. These proprietary viewers, which are typically only accessible on dedicated workstations, increase hardware needs, disallows many users from working remotely, and makes remote reading inefficient.
>
> These issues lead to organizational inefficiency, inflexibility, inhibited growth, and a high total cost of ownership.
>
> Healthcare providers now demand that their enterprise imaging solutions bring together storage, access and viewing under one umbrella to ensure clinicians have access to relevant patient medical information as well as the complete patient imaging history.
>
> Exhibit 4.8

45. Also, upon information and belief, additional challenges and barriers are encountered when integrating mobile technology for remote access into hospital information systems, including the following:

> A major challenge for today's healthcare organizations lies in the need to provide fast, reliable and simple access to this growing volume of image data in order to support patient data sharing and viewing and implement healthcare reform measures such as coordinated patient care and value-based payment. To make matters even more difficult for health IT departments, the majority of enterprise image data typically resides on multiple PACS or vendor neutral archives (VNAs). An increasingly valid method for enabling broad provider and patient access to images and other digital health information, is to take a mobile first approach. This allows providers to use the smartphones or tablets they carry with them every day -- both inside and outside hospitals – to view patient scans, transforming how they deliver care. A remotely-located neurologist, for example, can view a brain scan of a patient with a smartphone or tablet and make a diagnosis. This immediate treatment not only eliminates the expense of an ambulance transfer but could save a life as well. Additionally, two, three or more providers located across a large hospital campus can use their smartphones or tablets to coordinate patient care by simultaneously viewing and discussing a single patient image. In many situations, the capabilities of modern mobile technology are already providing significant time and cost saving advantages for the healthcare industry.

> Given the clear benefits of providing image access through smartphones and tablets, adopting mobile health IT should seem like a simple proposition. However, as every health IT executive and manager knows, integrating mobile devices into today's complex health IT environments is no easy task. Barriers across the enterprise include user resistance, lack of policy, security issues and infrastructure obstacles.
>
> Exhibit 3.12

46. Additionally, upon information and belief, healthcare providers are required to ensure the confidentiality and protection of patient health information in any systems they deploy:

> HIPAA is a set of regulations intended to ensure the confidentiality, availability and protection of patient health information, whether it is located in a doctor's EHR, a hospital server or a statewide health data registry. With patients increasingly aware of their right to access their own information, providers are being forced to open sensitive data to external access by patients while maintaining compliance with HIPAA. These regulations also protect patient information from access by non-authorized providers.
>
> Provide access to patient data with applications that track and record what data was accessed, when and how it was accessed and by whom. Mobile applications should also have the ability to restrict access to a patient's images or other information..
>
> Exhibit 3.12

47. Upon information and belief, compliance and security policies are critically important for any healthcare system, as discussed below:

> Every hospital or integrated health system has a security department responsible for all aspects of security and policies that protect patient data. Security executives are the gatekeepers for the network; without their support enterprise-wide use of mobile technology is not possible. Security administrators evaluate new technologies looking at the potential risks they might introduce including patient data exposure, network breaches or viral attacks. They also ensure that all technology is compliant with current security policies or if new policies need to be created.
>
> Educate security administrators on the benefits of mobile information access and enterprise image-viewing and the ability to provide mobile access while maintaining institutional security protocols..

Exhibit 3.12

48. Upon information and belief, data security is a major factor in the development and marketing of hospital technology and a critical consideration in any solution deployment:

> Data security continues to be a major health IT concern. A study conducted in 2012 by the Healthcare Information and Management Systems Society (HIMSS) found that 34% of respondents named security breaches as a top concern, and 23% said their organizations experienced a breach in the last year. This concern is only increasing with the use of mobile devices in healthcare. Devices are being used to access patient records and if downloaded data were to ever go missing, it would put the hospital at huge risk. Best practice is to ensure that patient data never reaches the end device. It is equally important to manage devices that are brought in from a users home.

Exhibit 3.2

49. Upon information and belief, the problems with a data breach or break-in can create significant problems for healthcare institutions, as described below:

> A recent spate of break-ins and breaches at high profile organizations, such as health insurer Anthem, has put health information security in the hot seat. With increased internal and external demands for access to protected health information, security departments are ever more conservative about providing access to patient information, particularly for mobile devices in remote locations.
>
> Shutting down the network to outside access, however, cuts healthcare providers off from tools that support modern healthcare delivery. The greatest benefit of mobile health emerges with remote, external access to patient data, which allows providers to practice outside hospital or clinic walls and allows care coordination with other providers. Best practices for mobile security range from using appropriate user authentication and security technologies to regulatory compliance to education.

Exhibit 3.12

50. Upon information and belief, it is important for enterprise-scale systems to utilize authentication, but this can lead to complexity and user problems as well, as described below:

> Ensuring that users are who they say they are is the job of authentication systems. In large enterprise environments, users often have multiple accounts - each with its own log-in procedure - to access health information systems. Multiple logins

> are not only confusing to the user and can slow their access to information, but are also hard for IT departments to manage.
>
> For both ease of use and to ensure security, mobile applications should be integrated into a single sign-on using Lightweight Directory Access Protocol (LDAP) or an Active Directory (AD). By automating access to multiple systems, single sign-on make it easier to manage users and ensure they have the right permissions for health information access.
>
> …
>
> Providing users with access to patient data from outside enterprise firewalls requires careful and secure management of users and servers. User groups need to be defined and authenticated, and servers need to be configured for safe and secure external connections. Cloud-based access provides one method for securely connecting multiple, approved users to patient data with a minimal amount of technical support.
>
> Put security and encryptions in place first, including SSL certificates, so that the network and servers can support secure outside access.
>
> Exhibit 3.12

51. Also, upon information and belief, the prevalence of mobile devices adds to potential security vulnerabilities and the complexity of permitting remote access to enterprise systems:

> Mobile devices make it simple to share and view electronic patient information from virtually any location at any time. This ease of communication is increasing the amount of patient data traveling both inside enterprises and outside their firewalls, making the enterprise vulnerable to security breaches. When patient data is transferred to mobile devices it can be vulnerable to data breaches or if the physical mobile device becomes lost or stolen.
>
> It is possible to use mobile technology to share and view information without transferring data permanently to a mobile device. Use applications that protect and encrypt data using HTTPS and do not transfer or store information on mobile devices.
>
> Exhibit 3.12

52. Similarly, upon information and belief, mobile and remote access also add complexity and work to IT departments to ensure security and regulatory compliance:

> Installations and upgrades for health IT applications, on both the user and the server end, can be complex and time consuming. For example, providing enterprise-wide image access typically requires new servers and databases, new user and workflow configurations and testing to ensure the application works on existing hardware without conflict. Mobile devices bypass many of these complications because they are designed to be self-supported. A zero user-support footprint eases IT department work loads and automatic installations provide a centralized mechanism for updating user devices with the latest in features and security. In addition, a mobile application can be designed to access existing servers and databases so that no changes to servers or database are needed.
>
> Implement tools and applications that support straightforward and easy server installation across all desired applications and databases. Be sure that mobile applications fully support self-installation and updates through familiar application store downloads.
>
> Exhibit 3.12

53. However, upon information and belief, healthcare professionals desire their remote access to provide the same functionality as traditional local hospital systems:

> Providers expect their mobile devices to support the same level of access as desktop computers. If they are confronted with complex login protocols or are not able view specific sets of data, the utility and benefits of mobile access decrease significantly potentially impacting patient care. User authentication frameworks must be designed to allow incorporation of new applications or external data sources. Support for LDAP/AD, for example, allows a new applications to authenticate users through existing usernames and passwords.
>
> User frameworks and mobile applications should support LDAP/AD to ensure consistent, reliable access to external and internal patient data.
>
> Exhibit 3.12

54. Similarly:

> With healthcare reform's focus on patient-centered care, patient engagement, providers and healthcare consumers alike require simple, transparent access to patient data. This trend, coupled with the exploding adoption of smartphones and tablets makes mobile technology the obvious platform to deliver a complete view of the digital patient - which now includes access to critical images along with lab reports, vital signs, prescriptions and other data in electronic form. In this new healthcare environment, tools that provide mobile image access must be designed to support the best practices of mobile health IT. Security, simple installation, zero-footprint IT support, fast image access and bandwidth optimization should

> be the job of the application, not the user or IT, leaving health IT experts to concentrate on the workflows and needs of their individual organizations.
>
> Exhibit 3.12

C. Background of the Inventions

55. The inventions relate generally to viewing at a client computer a series of three-dimensional virtual views, transmitted over the Internet, of a volume visualization dataset contained on one or more centralized databases.

56. It is an object of the inventions to provide one or more of the following: 1) methods and systems that overcome low bandwidth and high latency limitations that are inherent properties of the standard Internet and permits bandwidth usage to be optimized, particularly for interactive web application for visualizing large medical scans and other volume visualization datasets on any Internet connection; 2) methods and systems that overcome the problems of maintaining medical records for long periods of time under security and privacy by providing a common and centralized infrastructure for receiving, storing, processing and viewing large medical scans via a web portal where economic of scale can be applied generously.

57. The inventions are directed to viewing at a client device a series of three-dimensional virtual views over the Internet of a volume visualization dataset contained on at least one centralized database comprising at least one transmitter for accepting volume visualization dataset from remote location and transmitting it securely to the centralized database, at least one central data storage medium containing the volume visualization dataset, and a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request.

58. The inventions also can include a resource manager device for load balancing the

plurality of servers, a security device controlling the plurality of communications between a client device, and the server; and between the resource manager and central storage medium, and at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device.

59. The inventions further can include a web application adapted to satisfy a user's request by accepting at a remote location at least one user request for a virtual view of the volume visualization dataset, transmitting the request to at least one of the servers, receiving the resulting virtual view from the at least one server, and displaying the resulting virtual view to the user at the remote location.

60. Additionally, the inventions are directed to methods for viewing at a client device a series of three-dimensional virtual views over Internet of a volume visualization dataset contained on at least one centralized database.

61. The methods can include providing at least one central data storage medium containing the volume visualization dataset, providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request, and providing a client device linked to the at least one server and central storage medium over the Internet, the client device having local data storage medium for storing frames of views of the volume visualization dataset.

62. The methods can then include requesting at the client device at least one three-dimensional virtual view of at least a portion of the volume visualization dataset, determining if any frame of the requested at least one view of the volume visualization dataset is stored on the local data storage medium, and sending from the client device to the server a request for any frame of the requested at least one view not stored on the local data storage medium.

63. The methods can further include, at the server, creating the requested frame of the requested at least one view from the volume visualization dataset in the central storage medium, transmitting the created frame of the requested at least one view from the server to the client device, and displaying the requested at least one three-dimensional virtual view of the volume visualization dataset at the client device by displaying either the frame transmitted from the server or any frame of the requested series of views stored on the local data storage medium.

64. The volume visualization dataset may comprise a plurality of cross-sectional images taken at spaced intervals through an object. The client device may request a series of three-dimensional virtual view of at least a portion of the volume visualization dataset, with the series of views comprising a plurality of separate view frames. The requested series of three-dimensional virtual views of the volume visualization dataset may be displayed at the client device by sequentially displaying frames transmitted from the server along with any frames of the requested series of views stored on the local data storage medium. During the displaying of the requested series of three-dimensional virtual views of the volume visualization dataset at the client device, frames stored on the local data storage medium may be displayed along with frames transmitted from the server.

65. The determination of storage of any frame of the requested at least one view of the volume visualization dataset on the local data storage medium may be by creating a unique identifiable key of a request by the client device of a three-dimensional virtual view of the volume visualization dataset, storing on the local data storage medium the unique identifiable key of a prior request by the client device of a three-dimensional virtual view, comparing the unique identifiable key of a current request by the client device of a three-dimensional virtual view with a stored unique identifiable key of a prior request by the client device of a three-

dimensional virtual view, and determining if values of the current and prior unique identifiable keys are equivalent. If the values are equivalent, the method may include displaying from the local data storage medium a stored frame of the prior request of the three-dimensional virtual view. If the values are not equivalent, the method may include displaying a frame transmitted from the server of the current request by the client device of a three-dimensional virtual view.

66. The method may further include associating the unique identifiable key of a prior request by the client device of a three-dimensional virtual view with a stored frame of the prior request of the three-dimensional virtual view. If the values are equivalent, the method may include determining location of the stored frame of the prior request of the three-dimensional virtual view on the local data storage medium, and using such location to display the stored frame.

67. Additionally, the methods can also include providing at least one central data storage medium containing the volume visualization dataset, providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request, and providing a client device linked to the server and central storage medium over the Internet.

68. The methods can then include sending from the client device to the server a request for a plurality of three-dimensional virtual views of at least a portion of the volume visualization dataset. The plurality of views comprises a plurality of separate view frames, and the request includes a request for a lower image quality parameter for the frames and a request for a higher image quality parameter for the frames.

69. The methods can also include, at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower

image quality parameter frames to the client device, and displaying at least a portion of the requested lower image quality parameter frames at the client device.

70. The methods can further include, at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the client device, and displaying the requested higher image quality parameter frames at the client device.

71. After transmitting the lower image quality parameter frames to the client device, the server may transmit the higher image quality parameter frames to the client device while the client device is displaying the lower image quality parameter frames. The client device may display the higher image quality parameter frames prior to or after completing display of the lower image quality parameter frames. The frames may be transmitted from the server to the client device as a compressed video stream, or as one or more single frames.

72. Additionally, the methods can include providing at least one central data storage medium containing the volume visualization dataset, providing a server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request, and providing a client device linked to the server and central storage medium over the Internet.

73. The methods can then include requesting at the client device a series of three-dimensional virtual views of at least a portion of the volume visualization dataset, with the series of views comprising a plurality of separate view frames. The methods also include separating at the client device the requested series of three-dimensional virtual views into different groups of frames, and sending from the client device to the server a request for a first group of frames, while delaying sending to the server a request for a second group of frames.

74. The methods can further include, at the server, creating the requested first group of frames from the volume visualization dataset, and transmitting the first group of frames to the client device, and displaying the requested first group of frames at the client device while simultaneously sending from the client device to the server a request for a second group of frames.

75. The methods can also include, at the server, creating the requested second group of frames from the volume visualization dataset, and transmitting the second group of frames to the client device while the client device is displaying the first group of frames, and displaying the requested second group of frames at the client device immediately following the first group of frames, to maintain proper sequential display of the requested series of three-dimensional virtual views.

76. The methods may further include sending from the client device to the server a request for a subsequent group of frames while a previous group of frames is being displayed, creating at the server the requested second group of frames from the volume visualization dataset, transmitting the second group of frames to the client device while the client device is displaying the previous group of frames; and displaying the requested subsequent group of frames at the client device immediately following the previous group of frames to maintain proper sequential display.

77. The method may also include providing a plurality of central data storage media, with each data storage medium containing all or a portion of the volume visualization dataset, and may include selecting the data storage medium from which the requested frames of the requested series of views from the volume visualization dataset are created and transmitted. The system secured site may be a SAS70 Type II Compliant or equivalent audited or tested data

center. Multiple secured sites located on disparate physical location can be connected via an intranet.

78. There may be provided a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request, and a security device controlling the plurality of communications between a client device, and the server and central storage medium.

79. Additionally, the client device and server may be connected by a network having a latency time, and the requested groups of frames may be delayed in sending from the client device to the server in accordance with the latency time. The groups of frames are transmitted from the server to the client device as a compressed video stream, or as one or more individual frames. The requested frames may be stored at the client device local data storage medium.

80. Additionally, by keeping track of user interaction sequences and its corresponding rendered frames, bandwidth usage and server resources may be sufficiently enhanced so that the interactive performance of applications in low bandwidth conditions is possible. For example, a Radiologist user may move from one Sagittal cross section to another (commonly known as "Stacking'). Keeping track of user interaction sequences and its corresponding rendered frames also enables the display of 4D or higher dimensional dataset at interactive frame rates over low bandwidth.

81. Upon information and belief, improved healthcare technology is recognized as improving productivity and minimizing delays in getting to diagnoses and treatments due to data transfer:

> Increasingly healthcare professionals are being asked to improve the productivity of and minimize the delays between image acquisition and interpretation activities in order to reduce per patient costs. At the same time, enabling more healthcare professionals to access archived images and information reduces repetition and

leads to enhanced patient care. Achieving these benefits require solutions which enable efficient access to images and information from anywhere..

…

Deploying and maintaining medical imaging applications that meet these requirements can be an expensive proposition. Rapid technological evolution and advances in imaging solutions force continual upgrades and enhancements in software applications, operating systems and computer hardware platforms in order to deliver and enhance patient care and treatment...

Exhibit 3.14

82. Additionally, upon information and belief, benefits from solutions using the patented inventions are depicted below:

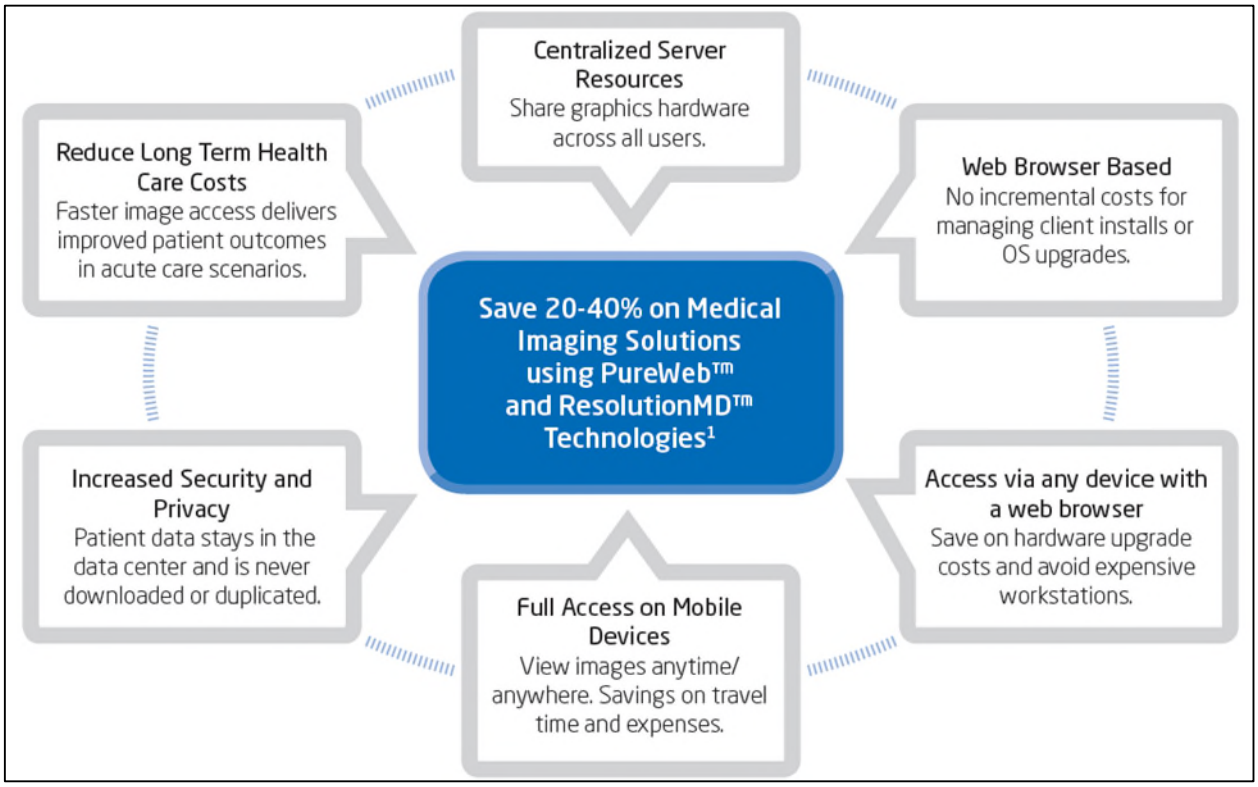


Exhibit 3.14

83. Upon information and belief, the challenges identified and objectives of recent healthcare solutions include as follows:

Challenge

> Viewing technologies can lack the robust integration, performance and tools that users need to interact optimally with images and reports for more efficient analyses and more accurate diagnoses.
>
> Solution
> A zero-footprint universal viewing platform delivers the ideal infrastructure to reduce IT complexity and streamline the clinical process, which means better overall care for patients.
>
> Exhibit 2.3

84. Similarly, upon information and belief, the healthcare industry has faced a number of challenges trying to improve PACs technology and patient care:

> Your enterprise viewing platform should be free of specialized hardware. Specialized hardware and GPUs increase upfront costs and require more support. Reduce costs, lower long-term maintenance, and remove failure points with a zero-footprint solution like Mach7's eUnity Enterprise Diagnostic Viewer.
>
> Change is constant and growth of your imaging data is expected. Your enterprise viewer should support this growth and provide unparalleled scalability. Healthcare providers need an enterprise viewing platform that adapts and expands overtime as these scalability needs change.
>
> Medical imaging is all about speed and performance. Your enterprise viewer needs to effectively handle network latency and deliver PACS-like viewing performance. In an imaging context, speed is everything and being forced to wait for rendering or image manipulation is painful. The architecture within your viewing platform can help mitigate network latency and improve the user experience.
>
> Not all viewers are created equal. Your enterprise viewing platform needs to provide a robust underlying architecture with a single development base for both diagnostic and enterprise users. This ensures that everyone gets the same robust viewing experience, integration limitations are solved, collaboration is improved, and your viewing platform can quickly adapt to new technologies.
>
> One of the most pervasive problems in our industry is integration. Your enterprise viewer should seamlessly integrate with your existing systems and federate image data across multiple disparate data sources. Additionally, it should know where and how to find images from anywhere in your enterprise. This provides greater flexibility, streamlined solution deployments, and improves downtime strategies. The most important thing, however, is that your users have access to the most recent study within your enterprise, regardless of where it was stored.

Don't allow your enterprise viewer to give your users downgraded image quality. Your enterprise viewer should provide 100% diagnostic images to all users, 100% of the time on any device. Providing diagnostic image quality on an HTML5 HTML viewer, even during image manipulation (zoom, pan, scroll, etc.), provides all users with the experience of a PACS workstation. This is a rare feature that provides clinical benefits every day.

In today's environment of heightened cybersecurity, it is critical to ensure your solution has you covered. Your enterprise viewer should check the regulatory boxes (FDA Class II Certification),and when your users are viewing images on any device, patient PHI (Private Health Information) should never be cached locally on the device.

What happens if you experience sudden downtime with your PACS? Your enterprise viewing platform should provide robust business continuity, disaster recovery, and the ability to become your "PACS" during downtime. Reliably providing medical images to physicians is critical for optimal patient outcomes. Ensure your viewing platform meets requirements to provide you a cost-effective solution that is fault tolerant, easy to maintain, and is available 24/7/365 – even if your PACS is not.

Radiologists are effectively medical consultants to other physicians. Your enterprise viewer should provide real-time collaboration tools. Not only should clinicians be able to easily collaborate with each other and the radiologist, but the images should be of diagnostic quality on any device during a collaboration session.

PACS workstations provide robust tools for radiologists, but why should your other users suffer? Your enterprise viewer should provide PACS workstation tools for all users (diagnostic and enterprise). Support for multiple image types with sophisticated hanging protocols, MIP/MPR, 3D, multi-monitor support, smart measurement tools, display of ECG waveforms, and support for digital breast tomosynthesis (DBT). After all, viewing matters, so choose your enterprise viewer wisely.

Exhibit 4.12

D. Awards and Recognition of the Plaintiff's Patented Technology

85. ***Plug and Play***. Plug and Play, the world's largest early-stage investor, accelerator, and corporate innovation platform with global headquarters in Sunnyvale, California, selected Plaintiff's patented technology platform in a competition among 120 companies for the Alliance For Covid-19 (AFC-19) diagnostic imaging software of choice. This

is because of its remote 4D and AI inherent capabilities of our patented cloud platform that provided instant access to diagnostic quality medical imaging remote just using a web-browser. This became a much-needed service during the Covid-19 pandemic to be able to access surgeons, specialist, and physicians anywhere easily.

86. ***AMD Innovation Summit***. Inventor Kovey Kovalan was invited to speak at the AMD Innovation Summit in 2013 for his pioneering use of GPU based volume visualization technology delivered through web interfaces, a unique, holistic cloud-based server side rendered solution for medical imaging.

87. ***Frost and Sullivan***. Plaintiff's patented technology platform was honored by Frost Sullivan with a Technology Innovation Award in 2011 based on the metrics of uniqueness of the technology, impact on new products/applications, impact on functionality, impact on customer value, and relevance of the innovation to the industry.

88. Frost & Sullivan noted

- Plaintiff's technology makes the internet an effective medium for the viewing, processing, and storing large medical image files, eliminating the physician's need to purchase and maintain costly IT hardware and software onsite.
- Additionally, the technology platform enables users from unrelated facilities anywhere worldwide to share information across disparate IT systems.
- Plaintiff's technology delivers the tools that can empower faster and more accurate diagnosis within an extremely affordable fee structure.
- It also provides a range of innovative technology for radiology department management and billing that effectively remove all barriers to adoption.

E. Overview of Patented Claims

89. Plaintiff is the owner of all enforcement rights and title in U.S. Patent No. 8,701,167 ("the '167 Patent", Exhibit 1.1), U.S. Patent No. 9,106,609 ("the '609 Patent", Exhibit 1.2), U.S. Patent No. 9,438,667 ("the '667 Patent", Exhibit 1.3), and U.S. Patent No. 10,930,397 ("the '397 Patent", Exhibit 1.4) (collectively, the "Asserted Patents").

90. Upon information and belief, Nuance's PowerShare product has included at least the Mach7 eUnity and/or Calgary Scientific ResolutionMD thin client viewers, and in combination with either viewer practices one or more claims of the patented inventions, including claims 1, 6, 7, 9, 12, 13 of the '167 Patent.

91. Claim 1 of the '167 Patent provides as follows:

> 1. A method for viewing at a client device a series of three-dimensional virtual views over Internet of a volume visualization dataset contained on at least one centralized database comprising:
>
> a. providing at least one central data storage medium containing the volume visualization dataset;
>
> b. providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
>
> c. providing a client device linked to the at least one server and central storage medium over the Internet, the client device having local data storage medium for storing frames of views of the volume visualization dataset;
>
> d. requesting at the client device a series of three-dimensional virtual views of at least a portion of the volume visualization dataset, the series of views comprising a plurality of separate view frames;
>
> e. determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium;
>
> f. sending from the client device to the server a request for any frame of the requested views not stored on the local data storage medium;
>
> g. at the server, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium;
>
> h. transmitting the created frames of the requested views from the server to the client device; and
>
> i. displaying the requested series of three-dimensional virtual views of the volume visualization dataset at the client device by sequentially displaying frames transmitted from the server along with any frames of the requested series of views stored on the local data storage medium.

92. Claim 6 of the ’167 Patent provides as follows:

6. A method for viewing at a client device a series of three-dimensional virtual views over Internet of a volume visualization dataset contained on at least one centralized database comprising:

a. providing at least one central data storage medium containing the volume visualization dataset;

b. providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;

c. providing a client device linked to the at least one server and central storage medium over the Internet, the client device having local data storage medium for storing frames of views of the volume visualization dataset;

d. requesting at the client device at least one three-dimensional virtual view of at least a portion of the volume visualization dataset;

e. determining if any frame of the requested at least one view of the volume visualization dataset is stored on the local data storage medium by:

f. creating a unique identifiable key of a request by the client device of a three-dimensional virtual view of the volume visualization dataset;

g. storing on the local data storage medium the unique identifiable key of a prior request by the client device of a three-dimensional virtual view;

h. comparing the unique identifiable key of a current request by the client device of a three-dimensional virtual view with a stored unique identifiable key of a prior request by the client device of a three-dimensional virtual view;

i. determining if values of the current and prior unique identifiable keys are equivalent;

j. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the three-dimensional virtual view; and

k. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the client device of a three-dimensional virtual view;

l. sending from the client device to the server a request for any frame of the requested at least one view not stored on the local data storage medium;

m. at the server, creating the requested frame of the requested at least one view from the volume visualization dataset in the central storage medium;

n. transmitting the created frame of the requested at least one view from the server to the client device; and

o. displaying the requested at least one three-dimensional virtual view of the volume visualization dataset at the client device by displaying either the frame transmitted from the server or any frame of the requested series of views stored on the local data storage medium.

93. Claim 7 of the ’167 Patent provides as follows:

7. The method of claim 6 further including associating the unique identifiable key of a prior request by the client device of a three-dimensional virtual view with a

stored frame of the prior request of the three-dimensional virtual view.

94. Claim 9 of the ’167 Patent provides as follows:

9. A method for viewing at a client device a series of three-dimensional virtual views of a volume visualization dataset contained on at least one centralized database comprising:

a. providing at least one central data storage medium containing the volume visualization dataset;

b. providing a at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;

c. providing a client device linked to the server and central storage medium over the Internet;

d. sending from the client device to the server a request for a plurality of three-dimensional virtual views of at least a portion of the volume visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution;

e. at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the client device;

f. displaying at least a portion of the requested lower image quality parameter frames at the client device;

g. at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the client device; and

h. displaying the requested higher image quality parameter frames at the client device; and

i. wherein, after transmitting the lower image quality parameter frames to the client device, the server transmits the higher image quality parameter frames to the client device while the client device is displaying the lower image quality parameter frames.

95. Claim 12 of the ’167 Patent provides as follows:

12. The method of claim 9 wherein the frames are transmitted from the server to the client device as a compressed video stream.

96. Claim 13 of the ’167 Patent provides as follows:

13. The method of claim 9 wherein the frames are transmitted from the server to the client device as one or more single frames.

97. The ’167 Patent underwent examination and received a notice of allowance stating:

> Upon searching variety of databases, the examiner considering Applicant's provided prior-art and examiner research of prior-art with are mention in form-892 and with the respect of Applicant's arguments clarify the difference and uniqueness of invention. It still hold the novelty even if the closest prior art US Publication No. 20040041846 and the Applicant's provided Foreign Patent application No. KR20030057669 (Korea) combined.
>
> Therefore, claims 17, 23, 26 and 32 in conjunction with all other limitations of the dependent and independent claims are not taught nor suggested by the prior art of record (PTO-892). Therefore, claims 17, 19-26 and 28-38 are hereby allowed in view of applicant's persuasive arguments and in the light of amendments to the claims.

Ex. 1.5 at 36.

98. Upon information and belief, Nuance’s PowerShare product has included at least the Mach7 eUnity and/or Calgary Scientific ResolutionMD thin client viewers, and in combination with either viewer practices one or more claims of the patented inventions, including claims 1, 4, 6-9, 19, 20, 22, 25, 26 of the ’609 Patent.

99. Claim 1 of the ’609 Patent provides as follows:

> 1. A system for viewing at a client device at a remote location a series of three-dimensional virtual views over the Internet of a volume visualization dataset contained on at least one centralized database comprising:
>
> a. at least one transmitter for accepting volume visualization dataset from remote location and transmitting it securely to the centralized database;
>
> b. at least one central data storage medium containing the volume visualization dataset;
>
> c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
>
> d. a resource manager device for load balancing the plurality of servers;
>
> e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;
>
> f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;
>
> g. a web application adapted to satisfy a user's request for the three-dimensional virtual views by:

a) accepting at a remote location at least one user request for a series of virtual views of the volume visualization dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the volume visualization dataset,
b) determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium,
c) transmitting from the remote location to at least one of the servers a request for any frame of the requested views not stored on the local data storage medium,
d) at at least one of the servers, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium,
e) transmitting the created frames of the requested views from at least one of the servers to the client device,
f) receiving the requested views from the at least one server, and displaying to the user at the remote location the requested series of three-dimensional virtual views of the volume visualization dataset by sequentially displaying frames transmitted from at least one of the servers along with any frames of the requested series of views stored on the local data storage medium.

100. Claim 4 of the ’609 Patent provides as follows:

4. The system of claim 1 wherein the web application is adapted to select a secured site by using a domain name address on a web browser.

101. Claim 6 of the ’609 Patent provides as follows:

6. The system of claim 1 wherein the web application is categorized as a medical device for diagnostic imaging viewing purpose.

102. Claim 7 of the ’609 Patent provides as follows:

7. The system of claim 1 wherein the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to at least one of the servers.

103. Claim 8 of the ’609 Patent provides as follows:

8. The system of claim 7 wherein an authenticated web application lists the volume visualization datasets that are viewable by the authorized user.

104. Claim 9 of the ’609 Patent provides as follows:

9. The system of claim 8 wherein the web application initiates a virtual viewing

by selecting a volume visualization dataset.

105. Claim 19 of the ’609 Patent provides as follows:

19. The system of claim 1 wherein the web application determines storage of any frame of the requested views of the volume visualization dataset on the local data storage medium is by:

a. creating a unique identifiable key of a request by the remote location of a three-dimensional virtual view of the volume visualization dataset;

b. storing on the local data storage medium the unique identifiable key of a prior request by the remote location of a three-dimensional virtual view;

c. comparing the unique identifiable key of a current request by the remote location of a three-dimensional virtual view with a stored unique identifiable key of a prior request by the remote location of a three-dimensional virtual view;

d. determining if values of the current and prior unique identifiable keys are equivalent;

e. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the three-dimensional virtual view; and

f. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the remote location of a three-dimensional virtual view.

106. Claim 20 of the ’609 Patent provides as follows:

20. The system of claim 19 wherein the web application associates the unique identifiable key of a prior request by the client device of a three-dimensional virtual view with a stored frame of the prior request of the three-dimensional virtual view.

107. Claim 22 of the ’609 Patent provides as follows:

22. A system for viewing at a client device at a remote location a series of three-dimensional virtual views over the Internet of a volume visualization dataset contained on at least one centralized database comprising:

a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;

b. at least one central data storage medium containing the volume visualization dataset;

c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;

d. a resource manager device for load balancing the plurality of servers;

e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;

f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;
g. a web application adapted to satisfy a user's request by:
a) accepting at the server a user request from the remote location for a plurality of three-dimensional virtual views of at least a portion of the volume visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution,
b) at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the remote location,
c) displaying at least a portion of the requested lower image quality parameter frames at the remote location,
d) at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the remote location,
e) displaying the requested higher image quality parameter frames at the remote location, and
f) after the lower image quality parameter frames is transmitted to the remote location, transmitting the higher image quality parameter frames from the server to the remote location while the remote location is displaying the lower image quality parameter frames.

108. Claim 25 of the ’609 Patent provides as follows:

25. The system of claim 22 wherein the web application causes the server to transmit the frames to the remote location as a compressed video stream.

109. Claim 26 of the ’609 Patent provides as follows:

26. The system of claim 22 wherein the web application causes the server to transmit the frames to the remote location as one or more single frames.

110. The ’609 Patent underwent examination and received a notice of allowance stating:

Upon searching variety of databases, the examiner considering Applicant's provided prior-art and examiner research of prior-art with are mention in form-892 and with the respect of Applicant's arguments clarify the difference and uniqueness of invention. It still hold the novelty even if the closest prior art US Publication No. 20040041846 and the Applicant's provided IDS, Foreign Patent 03-088030 (WO) combined.

> Therefore, claims 1, 22 and 27 in conjunction with all other limitations of the dependent claims, and independent claims are not taught nor suggested by the prior art of record (PTO-892). Therefore, claims 1-31 are hereby allowed in view of applicant's persuasive arguments and in the light of amendments to the claims.
>
> Ex. 1.6 at 29.

111. Upon information and belief, Nuance's PowerShare product has included at least the Mach7 eUnity and/or Calgary Scientific ResolutionMD thin client viewers, and in combination with either viewer practices one or more claims of the patented inventions, including claims 1-3, 8, 9, 11, 14, 15 of the '667 Patent.

112. Claim 1 of the '667 Patent provides as follows:

> 1. A system for viewing at a client device at a remote location a series of virtual views over the Internet of a volume visualization dataset contained on at least one centralized database comprising:
>
> a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;
>
> b. at least one central data storage medium containing the volume visualization dataset;
>
> c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
>
> d. a resource manager device for load balancing the plurality of servers;
>
> e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;
>
> f. at least one physically secured site for housing the centralized database, the plurality of servers, at least a resource manager, and at least a security device;
>
> g. a web application adapted to satisfy a user's request for the virtual views by:
>
> a) accepting at a remote location at least one user request for a series of virtual views of the volume visualization dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the volume visualization dataset,
>
> b) determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium,
>
> c) transmitting from the remote location to at least one of the servers a request for any frame of the requested views not stored on the local data storage medium,

d) at at least one of the servers, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium,
e) transmitting the created frames of the requested views from at least one of the servers to the client device,
f) receiving the requested views from the at least one server, and displaying to the user at the remote location the requested series of virtual views of the volume visualization dataset by sequentially displaying frames transmitted from at least one of the servers along with any frames of the requested series of views stored on the local data storage medium.

113. Claim 2 of the ’667 Patent provides as follows:

2. The system of claim 1 wherein the web application is adapted to select a secured site by using a domain name address on a web browser.

114. Claim 3 of the ’667 Patent provides as follows:

3. The system of claim 1 wherein the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to at least one of the servers.

115. Claim 8 of the ’667 Patent provides as follows:

8. The system of claim 1 wherein the web application determines storage of any frame of the requested views of the volume visualization dataset on the local data storage medium is by:

a. creating a unique identifiable key of a request by the remote location of a virtual view of the volume visualization dataset;
b. storing on the local data storage medium the unique identifiable key of a prior request by the remote location of a virtual view;
c. comparing the unique identifiable key of a current request by the remote location of a virtual view with a stored unique identifiable key of a prior request by the remote location of a two-dimensional virtual view;
d. determining if values of the current and prior unique identifiable keys are equivalent;
e. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the virtual view; and
f. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the remote location of a virtual view.

116. Claim 9 of the ’667 Patent provides as follows:

9. The system of claim 8 wherein the web application associates the unique identifiable key of a prior request by the client device of a virtual view with a stored frame of the prior request of the virtual view.

117. Claim 11 of the ’667 Patent provides as follows:

11. A system for viewing at a client device at a remote location a series of virtual views over the Internet of a volume visualization dataset contained on at least one centralized database comprising:

a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;

b. at least one central data storage medium containing the volume visualization dataset;

c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;

d. a resource manager device for load balancing the plurality of servers;

e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;

f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;

g. a web application adapted to satisfy a user's request by:

a) accepting at the server a user request from the remote location for a plurality of virtual views of at least a portion of the volume visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution,

b) at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the remote location,

c) displaying at least a portion of the requested lower image quality parameter frames at the remote location,

d) at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the remote location,

e) displaying the requested higher image quality parameter frames at the remote location, and

f) after the lower image quality parameter frames is transmitted to the remote location, transmitting the higher image quality parameter frames from the server to the remote location while the remote location is displaying the lower image quality parameter frames.

118. Claim 14 of the ’667 Patent provides as follows:

14. The system of claim 11 wherein the web application causes the server to

transmit the frames to the remote location as a compressed video stream.

119. Claim 15 of the ’667 Patent provides as follows:

15. The system of claim 11 wherein the web application causes the server to transmit the frames to the remote location as one or more single frames.

120. The ’667 Patent underwent examination and received a notice of allowance stating:

Upon searching variety of databases, the examiner considering Applicant's provided prior-art and examiner research of prior-art with are mention in form-892 and with the respect of Applicant's arguments clarify the difference and uniqueness of invention. It still hold the novelty even if the closest prior art US Publication No. 20080094398 and 20090063118 combined.

Claims 1, 11 and 16 in conjunction with all other limitations of the dependent claims, " a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium; at least one physically secured site for housing the centralized database, the plurality of servers, at least a resource manager, and at least a security device; a web application adapted to satisfy a user's request for the virtual views by: a) accepting at a remote location at least one user request for a series of virtual views of the volume visualization dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the volume visualization dataset, b) determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium, c) transmitting from the remote location to at least one of the servers a request for any frame of the requested views not stored on the local data storage medium, d) at least one of the servers, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium, e) transmitting the created frames of the requested views from at least one of the servers to the client device, receiving the requested views from the at least one server, and displaying to the user at the remote location the requested series of virtual views of the volume visualization dataset by sequentially displaying frames transmitted from at least one of the servers along with any frames of the requested series of views stored on the local data storage medium." and independent claims are not taught nor suggested by the prior art of record (PTO-892).

Therefore, claims 1-20 are hereby allowed in view of applicant's persuasive arguments and in the light of amendments to the claims.

Ex. 1.7 at 35-36.

121. Upon information and belief, Nuance's PowerShare product has included at least the Mach7 eUnity and/or Calgary Scientific ResolutionMD thin client viewers, and in combination with either viewer practices one or more claims of the patented inventions, including claims 1-3, 11-14, 16-18 of the '397 Patent.

122. Claim 1 of the '397 Patent provides as follows:

> 1. A system for viewing at a client device at a remote location a series of virtual views over the Internet of a medical imaging dataset contained on a remote database, comprising:
>
> a. at least one remote data storage medium containing the medical imaging dataset;
>
> b. at least one server in communication with the remote database and capable of processing the medical imaging dataset to create virtual views based on a client request;
>
> c. at least one physically secured site for housing the at least one server, the secured site comprising an audited or tested premises; and
>
> d. a web application adapted to satisfy a user's request for the virtual views by:
>
> a) accepting at a remote location via an encrypted communication connection at least one user request for a series of virtual views of the medical imaging dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the medical imaging dataset,
>
> b) transmitting from the remote location to the at least one server via the encrypted communication connection a request for any frame of the requested views not stored on the local data storage medium,
>
> c) at the at least one server, creating the requested frames of the requested views from the medical imaging dataset in the remote storage medium,
>
> d) transmitting, via the encrypted communication connection, the created frames of the requested views from the at least one server to the client device,
>
> e) receiving, and storing, on the local data storage medium the requested views from the at least one server, and
>
> f) displaying to the user at the remote location the requested series of virtual views of the medical imaging dataset by sequentially displaying frames transmitted from the at least one server along with any frames of the requested series of views stored on the local data storage medium.

123. Claim 2 of the '397 Patent provides as follows:

> 2. The system of claim 1 wherein the web application is adapted to select a secured site by using a domain name address on a web browser.

124. Claim 3 of the ’397 Patent provides as follows:

3. The system of claim 1 wherein the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to the at least one server and lists the medical imaging datasets that are viewable by the authorized user.

125. Claim 11 of the ’397 Patent provides as follows:

11. The system of claim 1 wherein the web application causes the server to transmit the frames to the remote location as a compressed video stream or as one or more single frames.

126. Claim 12 of the ’397 Patent provides as follows:

12. The system of claim 1 wherein genetic algorithms, self-organizing maps, neural networks or other machine learning algorithms are applied during processing of the medical imaging dataset.

127. Claim 13 of the ’397 Patent provides as follows:

13. A method for viewing at a client device at a remote location a series of virtual views over the Internet of a medical imaging dataset contained on a remote database, comprising:

a. providing at least one remote data storage medium containing the medical imaging dataset;
b. providing at least one server in communication with the remote database and capable of processing the medical imaging dataset to create virtual views based on client request, a first or a secondary security device controlling the plurality of communications between a client device and the server;
c. providing at least one physically secured site for housing the at least one server, the secured site comprising an audited or tested premises;
d. providing a web application accessible at the client device linked to the at least one server and storage medium over the Internet via an encrypted communication connection, the client device having local data storage medium for storing frames of views of the medical imaging dataset, the web application adapted to perform the steps of:
e. requesting at the client device via the encrypted communication connection a series of virtual views of at least a portion of the medical imaging dataset, the series of views comprising a plurality of separate view frames;
f. determining if any frame of the requested views of the medical imaging dataset is stored on the local data storage medium;
g. sending from the client device to the server via the encrypted communication connection a request for any frame of the requested views;

h. at the server, creating the requested frames of the requested views from the medical imaging dataset;
i. transmitting the created frames of the requested views from the server to the client device via the encrypted communication connection; and
j. displaying the requested series of virtual views of the medical imaging dataset at the client device by sequentially displaying frames transmitted from the server along with any frames of the requested series of views stored on the local data storage medium.

128. Claim 14 of the ’397 Patent provides as follows:

14. The method of claim 13 wherein the received frames of the requested views are stored on the client device local data storage medium.

129. Claim 16 of the ’397 Patent provides as follows:

16. The method of claim 13 wherein the client device displays higher image quality parameter frames after completing display of lower image quality parameter frames.

130. Claim 17 of the ’397 Patent provides as follows:

17. The method of claim 13 wherein the frames are transmitted from the server to the client device as a compressed video stream or as one or more single frames.

131. Claim 18 of the ’397 Patent provides as follows:

18. The method of claim 13 further including the step of:
applying genetic algorithms, self-organizing maps, neural networks or other machine learning algorithms during processing of the medical imaging dataset.

132. The ’397 Patent underwent examination and received a notice of allowance stating:

Upon searching variety of databases, the examiner considering Applicant's provided prior-art and examiner research of prior-art with are mention in form-892 and with the respect of Applicant's arguments clarify the difference and uniqueness of invention. It still hold the novelty even if the closest prior art US Publication No. 20100134484 and the Applicant's provided IDS, US Patent no. 6621918 combined. Claims 1 and 15 in conjunction with all other limitations of the dependent claims, and independent claims are not taught nor suggested by the prior art of record (PTO-892).

Therefore, Claims 1-4 and 7-20 are hereby allowed in view of applicant's persuasive arguments and in the light of amendments to the claims.

Ex. 1.8 at 22.

133. Additionally, a prior notice of allowance stated similarly:

> Upon searching variety of databases, the examiner considering Applicant's provided prior-art and examiner research of prior-art with are mention in form-892 and with the respect of Applicant's arguments clarify the difference and uniqueness of invention. It still hold the novelty even if the closest prior art US Publication No. 20070043940 and the Applicant's provided IDS, Foreign Patent 2006095269 (WO) combined.
>
> Claims 1 and 15 in conjunction with all other limitations of the dependent claims, " a web application adapted to satisfy a user's request for the virtual views by: a) accepting at a remote location via an encrypted communication connection at least one user request for a series of virtual views of the medical imaging dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the medical imaging dataset, b) transmitting from the remote location to the at least one server via the encrypted communication connection a request for any frame of the requested views not stored on the local data storage medium, c) at the at least one server, creating the requested frames of the requested views from the medical imaging dataset in the remote storage medium, d) transmitting, via the encrypted communication connection, the created frames of the requested views from the at least one server to the client device, e) receiving, and storing, on the local data storage medium the requested views from the at least one server, and f) displaying to the user at the remote location the requested series of virtual views of the medical imaging dataset by sequentially displaying frames transmitted from the at least one server along with any frames of the requested series of views stored on the local data storage medium." and independent claims are not taught nor suggested by the prior art of record (PTO-892).
>
> Therefore, Claims 1-4 and 7-20 are hereby allowed in view of applicant's persuasive arguments and in the light of amendments to the claims.

Ex. 1.8 at 52-54.

134. Each of the foregoing claims of the Asserted Patents is not directed to a mental process, abstract idea, law of nature, or natural phenomenon. Notwithstanding, it is self-evidence that each of the foregoing claims, when viewed as a whole, improves the technology and computer functionality of accessing and viewing medical imaging data. As shown above, each of the foregoing claims recites specific, substantial improvements to the technology and computer functionality of accessing and viewing medical imaging data, and thus they recite significantly more than any abstract ideas.

135. In particular, as noted in the discussions above, generating dynamic 3D views based on user interactivity requires resource-intensive processing, which prior art technology encounters tradeoffs and limitations from bandwidth, latency, portability, accessibility, security, and interactivity. For example, known prior art techniques required sufficient bandwidth and low latency networks to present information at interactive frame rates. Alternatively, entire datasets needed to be transferred to a local machine with sufficient processing capabilities to process and display locally. The present invention overcomes these limitations through a common and centralized infrastructure, for receiving, storing, processing and viewing large medical scans via a low-bandwidth web portal where economic of scale can be applied generously.

136. Upon information and belief, one or more defendants have actual knowledge of the family of Asserted Patents, at least as of 2017. Upon information and belief, the defendants have participated at trade shows and conferences where Plaintiff's patented technology was on display. Upon information and belief, Plaintiff spoke with representatives of Client Outlook at the 2017 Radiological Society of North America (RSNA) conference at their booth, including Client Outlook's Global VP of Sales. During this conversation, Plaintiff informed the representatives of Plaintiff's family of patents covering its technology, providing the list on a sheet of paper. Upon information and belief, Defendant Nuance has used the eUnitiy viewer of Client Outlook (which has merged into Defendant Mach7) since on or about July 2015.

137. Upon information and belief, the defendants have participated at trade shows and conferences where Plaintiff's patented technology was on display, including at least the 2015 RSNA. Additionally, Plaintiff's patents are marked on its website at https://aivisualize.net, and in subscription agreements with third parties since at least 2018.

F. Overview of Infringing Aspects of Nuance's PowerShare Product

138. Upon information and belief, Nuance PowerShare is described as providing an interconnected network for sharing patient healthcare information using web-based and mobile viewing applications:

> The PowerShare Network is comprised of healthcare facilities, providers and patients, allowing imaging exams to be shared directly with other clinicians and patients using simple web-based viewers or the mobile application. Quickly grow 'your' network using intuitive user interfaces and familiar social networking methods—easily find other providers and begin sharing in minutes. Plus, your data is secure and you decide with whom you want to share it. Convenient image sharing rules are available to further streamline your processes. PowerShare also handles automatic or manual reconciliation and transfer of images into PACS or other on-premise DICOM destinations such as VNAs.

Exhibit 2.0

139. Upon information and belief, Nuance PowerShare interconnectivity is depicted as follows:

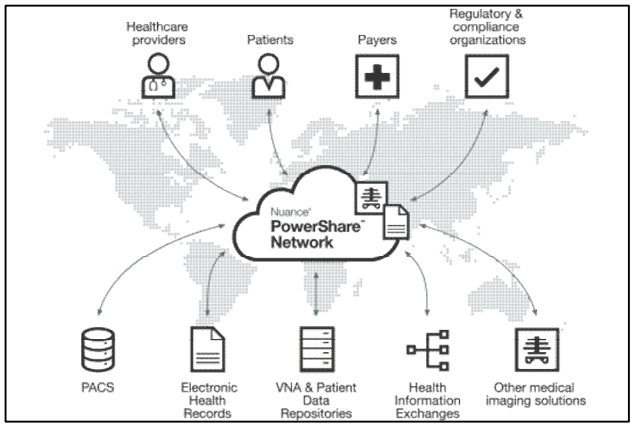


Exhibit 2.1

140. Upon information and belief, Nuance PowerShare is described as providing easy and secure access to view and share imaging data without needing to physically transport the data:

> Easily view and share both DICOM and non-DICOM imaging No matter where diagnostic images, reports or documents originate, the secure exchange of both

> traditional and non-traditional imaging is as intuitive as managing email. Users can access and upload DICOM studies and images taken on non-DICOM devices such as wound care photos or older vintage ophthalmic images and share JPEG, TIFF and PDF files just like any other image.
>
> Exhibit 2.2.1

141. For example, upon information and belief, Nuance PowerShare is described as providing multiple viewing options to assist healthcare professionals access and utilize patient imaging data for diagnosis and treatment:

> Multiple viewing options for better diagnosis and care
> eUnity viewer View, share and collaborate on medical images to improve delivery of care and inform patient conversations. Client Outlook/eUnity for PowerShare Read the datasheet(Open a new window)
> 3D viewer Universal viewer with expert tools and 3D reconstruction. FDA-cleared for diagnostic interpretation of all study types.
>
> Exhibit 2.2.1

142. Upon information and belief, Nuance PowerShare supports viewers that infringe, including the eUnity and ResolutionMD viewers.

> Multiple viewer options. PowerShare provides multiple viewing options to satisfy a range of needs. – The eUnity® universal viewer: As part of the PowerShare Network portfolio of universal viewers, Nuance offers the eUnity viewing platform A zero-footprint universal viewing platform providing flawless, diagnostic image quality, with image retrieval in only seconds; easily meeting the demanding information needs of clinicians. Simple and effective, quick to install, and easily learned, eUnity can support the image viewing needs of the largest organization, delivering flawless display of images at full quality. – The 3D Viewer provides an expert tool set as well as 3D reconstruction. This universal viewer is FDA-cleared for diagnostic interpretation of all study types and provides server-based rendering and streaming for instant access to even the largest data sets such as cardiac CT, echocardiograms and angiograms.
>
> Exhibit 2.0

143. Additionally, upon information and belief, Nuance PowerShare is described as providing numerous benefits as a result of this infringing viewing capability:

> Mobile device support for use on smartphones and tablets The PowerShare Image Sharing app can be downloaded for free and used on any iPhone®, iPad® or iTouch® device. Smartphone and tablet users can also access and share images through an Internet connection regardless of platform. With the app you can: View images with zoom, pan and scrolling capabilities Handle multi-frame data sets such as echocardiograms and angiograms and support playback at acquisition rates Capture images securely with the device's camera Upload medical imaging to the cloud repository Share medical imaging with physicians and patients in your network Route to VNA or PACS based on your user-defined rules
>
> …
>
> In addition, images captured using the PowerShare Image Sharing mobile app are also subject to user-defined rules and can be automatically routed to a VNA or PACS.
>
> …
>
> Quick and secure
> View, manage and share medical images and diagnostic reports with healthcare professionals and patients.
>
> Access images and collaborate in real-time
> No more CDs or VPNs. Share or access traditional and non-traditional images as easily as managing email to collaborate with your rapidly growing professional network.
>
> Exhibit 2.2.1

144. Additionally, upon information and belief, Nuance PowerShare is described as using a zero-footprint viewer to deliver easy access to imaging data while still staying secure:

> Enhance today's technology and power your future
> Do more with your existing EHR/EMR systems, PACS, VNA. Leverage your choice of zero-footprint Enterprise Viewers and PowerScribe technologies to seamlessly migrate to value-based healthcare.
>
> Support for the unique needs of IDNs
> Addressing the IT infrastructure needs for distributed image workflow, including cross corporate enterprise image query and employed physician image query.
>
> Ensure secure medical image exchange and storage HIPAA compliant, with layers of security to safeguard Protected Health Information (PHI).
>
> …

> Immediate access to digital medical images and reports via integrated clinical viewers, provides more insight for referring physicians for faster, better-informed care decisions. It also eliminates unnecessary repeat exams and associated radiation exposure and removes the hassles associated with physical image sharing.
>
> …
>
> Access and share medical imaging with your growing network Our medical imaging solution was designed to fill all needs across the continuum of care, while helping you build a community dedicated to accountability. Now embedded image viewers enhance clarity with new image review tools available to the clinician.
>
> …
>
> Supports an organizations compliance with the requirements of HIPAA and HITECH
> PowerShare Image Sharing supports an organization's compliance with HIPAA and HITECH utilizing a highly secure SOC2 Type II data center.
>
> In addition, we work closely with clients to ensure their unique privacy and security needs are met.
>
> Exhibit 2.2.1

145. Additionally, upon information and belief, Nuance PowerShare is described as providing multiple layers of authorization and security controls:

> Multiple layers of authorization and security controls
> Our security layers start with a detailed Service Agreement and Business Associate Agreement (BAA) that safeguard Protected Health Information (PHI) from unauthorized disclosure or misuse. These agreements also help you comply with your HIPAA obligations. Other security features include: Intrusion detection and intrusion prevention systems Full-system audit trails Secure user authentication Sophisticated access control methodologies Image compression and data integrity checks
>
> …
>
> Advanced, secure communication network built into the infrastructure Our system is fortified by sophisticated firewall architecture, strong data encryption assuring a similar or higher level of security than any industry-standard VPN, rigorous member verification and strict user authentication—protecting against loss,

> unauthorized use or compromise. Unlike most medical imaging solutions today, our platform has an advanced, secure communication network already built into the infrastructure, eliminating the need for VPNs. It can be implemented as an easy-to-download software agent or simply run in "zero-footprint" mode inside your browser.
>
> …
>
> IDN infrastructure support Helping IDN systems address the IT infrastructure needs for distributed image workflow, including:
>
> > Corporate Enterprise Image Query without the need for image shares requests.
> > Employed Physician Image Query without the need for image shares requests. Physicians will be able to take action on facility studies as if it were their own.
>
> Exhibit 2.2.1

146. Similarly, upon information and belief, Nuance PowerShare is described as complying with various security certifications while delivering the benefits of remote image access:

> You're in control
> Gain visibility into all imaging across your network. No need to submit an image request or wait on image sharing.
>
> Empower your patients
> Mobile access and seamless integration put your patients at the center of their care.
>
> Join the industry's most widely used network
> Secure access to imaging anytime, anywhere through a cloud-based, HITRUST CSF-certified solution.
>
> Image-enable your EHR or HIE
> Self-service, point-of-care image access without delay or reliance on other party.
>
> Be truly mobile
> Patients and providers can effortlessly share images on any mobile device, view them with the integrated eUnity viewer, and take and upload visible light images.
>
> Exhibit 2.2.2

147. Upon information and belief, Nuance PowerShare is touted as providing the benefits of increased access and security at minimal additional cost or burden:

> Minimal IT costs and burden
> No software or hardware to buy. No need to burden your IT department with integration and maintenance. All you need to get started and access, manage and share medical images and reports is an Internet-connected computer, mobile device or our mobile app.

Exhibit 2.2.1

148. Upon information and belief, Nuance PowerShare is touted at providing the following benefits from sharing, accessing, and viewing medical imaging anytime, anywhere:

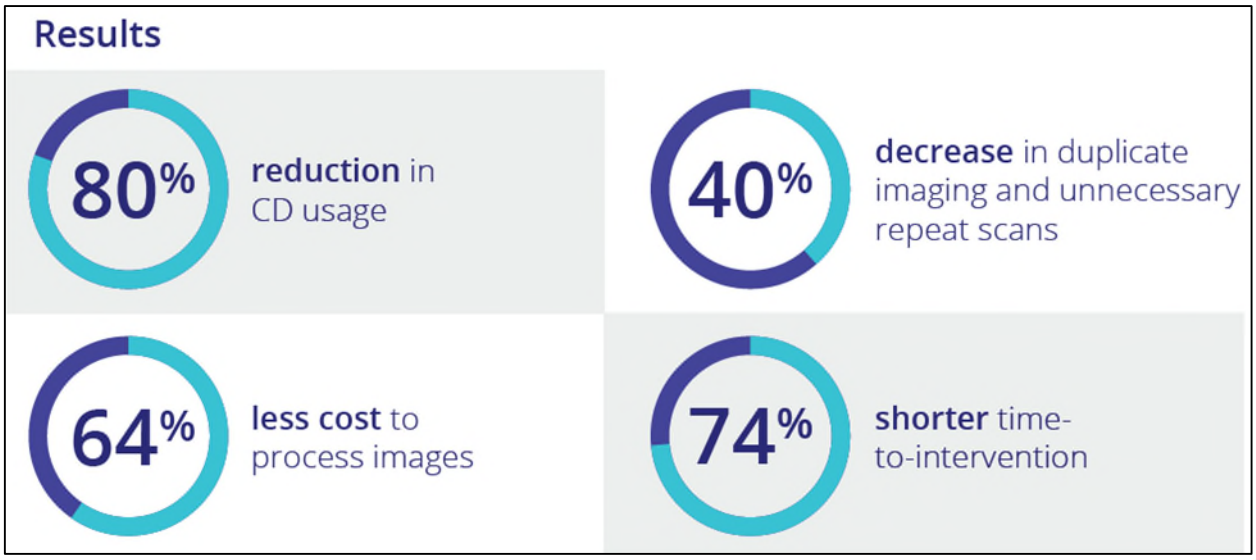


Exhibit 2.5

149. Additionally, upon information and belief, Nuance PowerShare is touted at providing the following benefits to patients and healthcare providers:

> With Nuance PowerShare Image Sharing, community hospitals can share patient imaging with the stroke center via PowerShare's cloud-based image sharing network. This network enables access to medical images and diagnostic reports on-demand, without the need for costly VPNs or CDs.
>
> More than 7,500 facilities already rely on the PowerShare Network, the nation's largest connected network for image and report exchange, and those organizations are supported by PowerShare Outreach Services professionals. They streamline

the network building process, connecting physicians and facilities—regardless of their location—on behalf of subscribers and in a matter of days.

No longer at the mercy of unreliable physical media or expensive, hard-to-manage VPN-based networks, healthcare organizations can reduce costs and immediately improve time to value through the PowerShare Network.

In less than 60 days, one national network of cancer care and research centers was able to connect to more than 250 sites, allowing facilities to send imaging directly from their PACS, nearly eliminating the need for physical media and decreasing time to treatment.

KEY BENEFITS

—Simplifies and secures access to imaging studies at the point of care, even when studies were performed off-site.
—Streamlines the network building process by leveraging the largest network of health organizations, with BAA agreements already in place.
—Reduces costly and unreliable image exchange methods.
—Improves the patient transfer process with streamlined treatment plans.
—Avoids unnecessary radiation exposure from redundant imaging to improve care quality and patient safety.
—Grows revenue opportunities in key service lines by offering sub-specialty or off-hour reading services.

Exhibit 2.6

150. Additionally, upon information and belief, Nuance PowerShare's client application includes at least code in the following subroutines in the HttpAuthenticator file, indicating authentication of an HTTP client session:

public boolean isAuthenticationRequested
public boolean handleAuthChallenge

151. Similarly, the following subroutines in the AuthenticatorAdapter file also indicate password authentication:

public Request authenticate
public Request authenticateProxy
private InetAddress getConnectToInetAddress

152. Additionally, upon information and belief, Nuance PowerShare's client application includes at least code in the following subroutine in the ImagesWebViewFragment file, indicating a web-based delivery of images rendered from a remote server:

public View onCreateView

153. Additionally, upon information and belief, Nuance PowerShare's client application includes at least code in the following subroutines in the ImageCache, indicating image caching of remotely rendered images:

public class ImageCache
public static ImageCache getInstance

154. Additionally, upon information and belief, the Nuance PowerShare's client application includes at least code in the following subroutine in the ImageFetcher, indicating fetching of cached images:

private void initHttpDiskCache

155. Additionally, upon information and belief, the Nuance PowerShare's client application includes at least code in the following subroutine in the ImageFetcher, indicating clearing or flushing of internally cached images:

public void clearCacheInternal()
public void flushCacheInternal()

G. Overview of Infringing Aspects of the eUnity Viewer in Nuance PowerShare

156. Upon information and belief, Nuance PowerShare integrates with and offers the eUnity viewer as part of its functionality to healthcare professionals and users.

157. For example, upon information and belief, Nuance PowerShare includes the eUnity viewer to provide image sharing and access:

Viewer: eUnity
View, share and collaborate on medical images to improve delivery of care and inform patient conversations. The powerful eUnity viewing platform provides

> universal access to images and reports across locations, departments and storage formats.
>
> Exhibit 2.2.1

158. Similarly, upon information and belief, the eUnity viewer is described as a zero footprint universal viewer in the Nuance PowerShare solution:

> Solution
> A zero-footprint universal viewing platform delivers the ideal infrastructure to reduce IT complexity and streamline the clinical process, which means better overall care for patients.
>
> As part of the PowerShare Image Sharing portfolio of universal viewers, Nuance offers the eUnity viewing platform. The eUnity platform provides flawless, diagnostic image quality, with image retrieval in only seconds; easily meeting the demanding information needs of clinicians.
>
> Exhibit 2.3

159. Upon information and belief, Nuance PowerShare describes its eUnity viewer is as providing the following benefits:

> Performance and quality
> Supported by unique server technology, eUnity is the fastest enterprise viewer available today. Within the hospital, or across home DSL or cable network connections, eUnity performs as well as installed software without sacrificing image quality. Even X-Ray angiography CINE runs play at 30 fps while you window and level, zoom and pan.
>
> …
>
> Easy to use; easy to deploy
> eUnity can be installed, then up and running, across the entire healthcare enterprise in mere days. Accessed through a commonly configured web browser, the zero-footprint application is simple to support and manage. Further, eUnity is easy to learn and use, allowing busy clinicians to adopt this highly intuitive viewer with minimal or no training.
>
> Exhibit 2.3

160. Upon information and belief, the eUnity viewer permits image access to the Nuance PowerShare network anywhere across the world:

> eUnity, alongside PowerShare Image Sharing, optimizes access to high quality images across disparate users by combining with the world's largest medical image sharing to securely connect with radiologists, healthcare organizations, referring physicians and patients, regardless of geographic location, medical discipline or technology platform.

Exhibit 2.3

161. For example, upon information and belief, the eUnity viewer is depicted as providing multiple views remotely rendered (2D and 3D) from patient imaging data stored at a server:

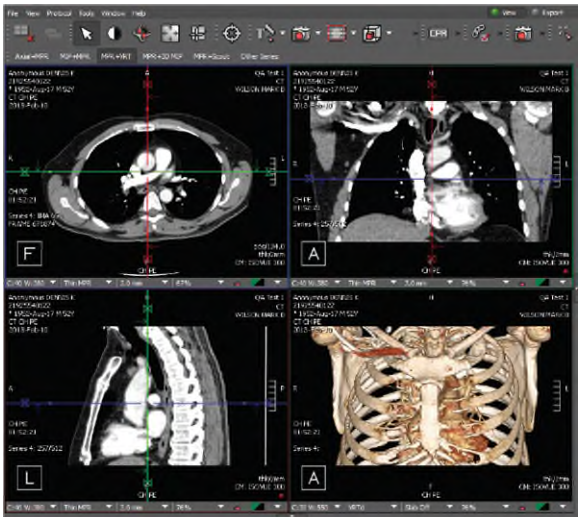


Exhibit 2.0

162. Upon information and belief, the FDA 510K for the eUnity viewer further describes the remote rendering of patient imaging data and providing access using only a standard web browser at the client side:

> eUnity is an enterprise medical image viewer that provides access to full quality images from anywhere using nothing more than a standard web browser. Combined with a calibrated monitor, it can be used to make diagnostic decisions.
>
> …
>
> Device Description: Client Outlook has developed eUnity to load, display and manipulate medical (DICOM) images within a web-browser without installing client software. eUnity is a server-based software solution that extends common web-browsers on the most popular operating systems into medical review

> stations; removing a technical barrier that had long been a key contributor to poor medical image access.
>
> …
>
> Intended Use: Client Outlook's eUnity enables health professionals to access, manipulate and collaborate real-time over full quality medical images using any web-browser without installing client software. eUnity is a server-based solution that connects to any PACS and displays DICOM images within the hospital, securely from remote locations, or as an integrated part of an EHR or portal. eUnity offers diagnostic quality images with the performance of installed PACS viewing software.
>
> Exhibit 4.10

163. Upon information and belief, the FDA 510K for the eUnity viewer also describes functionality associated with the viewer such as manipulating the 2D and 3D visualizations of remotely rendered patient imaging data:

> eUnity is a software application that displays medical image data and associated clinical reports to aid in diagnosis for healthcare professionals. It performs operations relating to the transfer, storage, display, and measurement of image data. eUnity allows users to perform image manipulations, including window/level, rotation, measurement and markup. eUnity provides 2D display, Multi-Planar Reformatting and 3D visualization of medical image data, and mobile access to images.
>
> Exhibit 4.10

164. Upon information and belief, the eUnity viewer provides lossless and lossy image compression for the remotely rendered images of patient imaging data:

> eUnity displays both lossless and lossy compressed images. For lossy images, the medical professional user must determine if the level of loss is acceptable for their purposes. Display monitors or mobile devices used for reading medical images for diagnostic purposes must comply with applicable regulatory approvals and with quality control requirements for their use and maintenance. For Mobile diagnostic usage only when a full workstation is not available.
>
> Exhibit 4.10

165. Upon information and belief, the eUnity viewer is described as providing a zero footprint platform for viewing the remotely rendered images:

Exhibit 4.1
https://youtu.be/inx-5mGw9pE?t=17

166. For example, upon information and belief, the eUnity viewer is described as providing diagnostic quality images from the remotely rendered patient imaging data:

Exhibit 4.1
https://youtu.be/inx-5mGw9pE?t=43

167. For example, upon information and belief, the eUnity viewer is described as a client application running inside a web browser that does not store the patient imaging data but does locally cache the remotely rendered images for the session, which is recommended to be cleared by closing the browser:

> Client Outlook – eUnity Viewer (Flash) The client must be run inside a browser that supports Flash Player version 10.0 or greater. Using the most recent Flash Player release is recommended. While eUnity stores no patient information on the client machine, we do recommend closing the browser when finished viewing images with eUnity. p.3

Exhibit 2.4

168. For example, upon information and belief, the eUnity viewer is described as providing load balancing for the remote rendering across a number of servers:

> For sites sending more than 800 studies / day, add an additional server per 800 study volume to accommodate load balancing across two or more gateways. p.5

Exhibit 2.4

169. For example, upon information and belief, the eUnity viewer is described as providing comparable performance of a PACS workstation through a zero footprint viewer that delivers remotely rendered images from the patient imaging data:

> Performance of a PACS workstation from a zero footprint viewer, enabling users to provide time sensitive diagnostic reviews from any location, providing the patient with the best and most accurate care possible.
>
> A single image viewing platform for both the enterprise and diagnostic users, does not require specialized hardware, is very scalable, robust, manageable, and cost effective.

Exhibit 4.2

170. Similarly, upon information and belief, the eUnity viewer is described as a zero footprint diagnostic image viewing platform for health professionals to access, manipulate, and collaborate over remotely rendered patient imaging data:

> eUnity™ is a zero-footprint diagnostic image viewing platform that allows for primary diagnosis and radiology reading. Healthcare professionals are able to access, manipulate and collaborate over diagnostic quality medical images on multiple monitors, using hanging protocols, and so much more.
>
> …
>
> eUnity is a zero-footprint viewer that displays diagnostic quality images, 100% of the time from anywhere, on any device*, with no downsampling, even when interacting with the images. Our unique technology, allows you to have fast, reliable performance that is as good as PACS. In fact, regardless of your location, you are able to experience this level of performance from our zero-footprint

viewer. This provides you with the ability to read and diagnose quickly and effectively.

Exhibit 4.3

171. Similarly:

eUnity™ is a feature rich, enterprise viewing platform that enables clinicians to quickly access fully diagnostic quality images from any location, on any device, in real time. eUnity will present all the information gathered (DICOM & non-DICOM) in a single user interface. eUnity does not require specialized hardware, supports many image types, including ecg waveforms, supports MIP/MPR &3D and so much more.

eUnity runs on mobile devices, supporting both the mobile web-browsers (HTML5 and Flash) as well as native apps for iOS and Android devices*. Both clients are at feature parity with the functionality of launching eUnity from any desktop web-browser. This provides you with the same experience regardless of the platform or device you are using.

…

With eUnity, clinicians can now access the most recent and relevant image and patient information from a single zero-footprint viewer. We support DICOM and non-DICOM data, integrate with EMR's, and query multiple image sources, enabling clinicians to view all relevant patient information from a single user interface. eUnity removes the barriers of when and how clinicians access the most critical patient information, improving patient care.

Exhibit 4.4

172. Upon information and belief, the eUnity viewer is also described as providing a zero footprint enterprise diagnostic viewing solution using HTML5 and a web browser to deliver remotely rendered patient imaging data:

We have built the industry leading zero-footprint enterprise diagnostic viewing solution. It provides diagnostic quality and high performance 100% of the time, even for clinical viewing. It can be accessed on any device with an HTML5-enabled web browser, ending the need for dedicated workstations. And it's been designed to integrate with any PACS, VNA, or other image archive and can launch from any EMR. All of this means you can have one single viewer for all of your users, drastically reducing cost and complexity while increasing access.

> Enabling enterprise imaging data management is the next step beyond the viewer. With industry leading vendor neutral archiving and image data management capabilities, customers partner with Mach7 to consolidate all images and imaging data in a single location. This reduces system complexity, makes data more accessible, and unifies the entire patient record. Plus, we give you full control over your data by exposing the DICOM attributes and giving you the ability to modify them, so data that was once proprietary in a traditional PACS now truly becomes "your" data. With Mach7, all it takes is one investment to level the playing field for all your users. While other companies claim they offer Enterprise Imaging, Mach7 delivers on this promise. Our Enterprise Imaging Solution drives and supports workflows across the enterprise to optimally capture, index, manage, store, distribute, view, exchange, and analyze all clinical imaging and multimedia content to enhance your patient's electronic health record.
>
> Exhibit 4.8

173. Upon information and belief, the eUnity viewer is described as providing an FDA-approved zero footprint viewer for use by healthcare professionals, including with AI algorithms to add predictive modeling:

> Give clinicians the viewing experience they desire while simultaneously reducing technical complexity. The eUnity zero-footprint viewer connects departmental imaging from across the enterprise to deliver studies to care providers via the EMR. It can easily be expanded to support diagnostic viewing for radiology groups seeking to move to a flexible FDA-approved solution for full reading and/or teleradiology.
>
> …
>
> Mach7 gives you a consolidated imaging infrastructure that is ready to be connected to AI algorithms. From diagnostic and operational support to predictive modeling and efficiency improvement, we've also partnered with top AI platforms so your enterprise can easily enable these capabilities.
>
> Exhibit 4.9

174. Additionally, upon information and belief, the eUnity viewer is described as providing a zero footprint viewer with rich visualization and manipulation tools:

> eUnity SMARTviewer eUnity is a unique zero-footprint viewing and integration software platform that sets the foundation for a boundary-less, unrestricted enterprise where all users have single access to diagnostic imaging data from any source, to view on any web-enabled device and from any location.

> Its back-end integration engine is the power that knows where and how to find images, including valuable priors and clinical content from any vendor source, while the front-end viewing framework presents the images with superlative functionality that meets the distinct clinical performance needs of multidisciplinary users.
>
> The outcome: Mach7's eUnity SMARTviewer can be used for enterprise viewing by all clinicians, referring physicians and specialists, as well as diagnostic reading by radiologists including sub-specialties like mammography. These multi-tasking capabilities position it as an essential component in a vendor-neutral enterprise strategy that strives to make flexibility its hallmark.
>
> eUnity SMARTviewer offers rich features such as MIP/MPR and 3D, advanced hanging protocols, and full support for multiple monitors. The user can consistently load and review images the same way every time and can match the PACS reading environment throughout the enterprise.
>
> …
>
> PATIENT AND CLINICAL PORTAL
> Leveraging the Mach7 Portal's universal zero footprint clinical image viewer, patients and physicians can access and share medical images and data over the web regardless of the media format. The portal allows users to easily import and export images, eliminating the need for CDs.
>
> MOBILE IMAGE CAPTURE
> Capturing non-DICOM images is of growing importance to healthcare organizations as point-of-care services become more prevalent. Mach7's mobile app, iModality, allows users to capture these images and store them seamlessly in the archive.
>
> Exhibit 4.11

175. Furthermore, the eUnity viewing platform is described as providing server-side hardware schemes that significantly reduce the equipment requirements and complexity at the client device:

> eUnity™ is a diagnostic, enterprise image viewing platform that provides the IT team with a solution that is highly scalable, hardware agnostic, designed to effectively handle network latency, and is future proof. eUnity does not use any specialized hardware, like GPUs, and leverages your existing virtual machine (VM) environment. You will have one image viewer for all your users in an easy to manage, simple to use, and fast to deploy solution.

eUnity does not require expensive, specialized hardware such as Graphics Processing Units (GPU's). This eliminates single point of failures (SPOF), hardware that becomes obsolete, is expensive to refresh, and difficult to install. eUnity results in a cost effective, more reliable, and easier to maintain solution.

eUnity installs on a regular server, is hardware agnostic, and can be deployed in a virtual machine environment. This provides your IT team with reduced infrastructure costs, business continuity, and ease of maintenance.

Whether your users are accessing eUnity from the office, at home, or any other location, they will be able to quickly view images on eUnity, providing enhanced user satisfaction. eUnity is fully functional on any hardware platform and any device, including mobile devices. eUnity supports native iOS and Android apps, as well as mobile browsers. Our thoughtful design, intelligently supports both old and new web-browsers, eUnity will automatically select HTML5 and fall back to Flash depending on your web-browser's capability.

Receive immediate clinical value with eUnity as your enterprise viewer. You do not need a VNA to reap the benefits of a zero-footprint viewer. eUnity is able to integrate with an enterprise's disparate systems and perform federated queries, ensuring the user is able to access the most recent study available from all systems in an aggregated view.

…

eUnity was designed to work on regular servers and can be fully virtualized, ensuring the hardware footprint is small and something your healthcare enterprise likely has available. Since eUnity does not require any specialized hardware, like graphics processing units (GPU's), and supports querying multiple images sources, all the deployment can occur remotely, reducing deployment costs and implementation time.

…

eUnity is built on a dynamic architecture that is not tied to any runtime or underlying technology. eUnity is developed on a single code base for all platforms (enterprise, diagnostic, HTML5, flash, and so on), providing all users with the same rich user experience. This also allows eUnity to adapt to new technologies that come to market (i.e. HTML5)at a much faster speed than our competitors. This unique approach provides your IT team with peace of mind that their investment in eUnity will be able to adapt and leverage new technologies.

Exhibit 4.5

176. Upon information and belief, the eUnity viewer is described as providing a number of functionalities for viewing and manipulating the remotely rendered images:

> eUnity is a feature rich zero footprint diagnostic viewer, with features such as MIP/MPR and 3D, advanced hanging protocols, and full support for multiple monitors. You can consistently load and review images the same way every time, and you can match your PACS reading environment throughout the enterprise. eUnity uses advanced hanging protocol configurations that gives you the ability to work the way you want, when you want. With eUnity's unique multi-monitor and study layout options, you can have structured or unstructured reading experience with our comparison and shuffle modes, allowing you to only interact with the images and studies that you want.
>
> …
>
> eUnity enables you to efficiently perform your critical tasks, whether you are diagnosing a stroke, consulting on an oncology case, or reading a study. As a true diagnostic viewing platform, eUnity supports the vital clinical workflows of your departments and the enterprise. You will have access to the necessary tools and workflow where and when you need it; MIP/MPR and 3D done on the fly or as part of the hanging protocols, multiple monitor support for better viewing and diagnosing, being able to see all of the patient data, as well as breast tomosynthesis, echocardiograms, and ECG waveforms.

Exhibit 4.3

177. Similarly:

> eUnity™ is a feature rich, enterprise viewing platform that enables clinicians to quickly access fully diagnostic quality images from any location, on any device, in real time. eUnity will present all the information gathered (DICOM & non-DICOM) in a single user interface. eUnity does not require specialized hardware, supports many image types, including ecg waveforms, supports MIP/MPR &3D and so much more.
>
> As clinicians, you will finally have access to the same lossless, diagnostic quality images as the radiologist! You will access diagnostic quality images, 100% of the time from any location, on any device*. eUnity effectively handles network latency and provides the same, feature-rich, unparalleled performance to all users.
>
> Our tools are context aware. eUnity is a smart platform that knows what images you are reviewing, where on the image you are reviewing and what measurement results you expect to see. The same measurement tool behaves appropriately based on the image type. For example, line measurement will display the appropriate units for a CT and for a cardiac ultrasound. You will be more efficient

> as a result of this mindful design, improving your user experience and positively impacting patient care.
>
> Exhibit 4.4

178. For example, upon information and belief, the eUnity viewer is described as providing collaboration and shared real-time image interaction with multiple remote users over the same remotely rendered, diagnostic quality images from patient imaging data:

> eUnity allows you to collaborate, in true real-time. Unlike the traditional method of using a streaming based technology, which is not diagnostic quality, eUnity uses a more intelligent method for collaboration. eUnity ensures the images displayed to all users during collaboration are diagnostic quality and all image manipulation is real time. For example, when a physician is collaborating with a peer for an oncology case, both physicians can be assured that they are viewing diagnostic quality images.
>
> Exhibit 4.3

179. Similarly:

> eUnity allows you to collaborate with your peers, while viewing diagnostic quality images. eUnity provides a fully shared collaboration experience for all users. This provides a faster, real-time, rich collaboration experience, ultimately improving patient care. For example, clinicians at a rural hospital can collaborate with a neuro-radiologist to review a stroke patient's status. The neuro-radiologist can be assured that they are viewing full diagnostic images, 100% of the time.
>
> Exhibit 4.4

180. For example, upon information and belief, the eUnity viewer is described as providing healthcare compliant security for all patient information despite allowing remote access through a web-browser:

> Securing patient information is critical for all healthcare institutions. With eUnity all communication containing patient information is secure and encrypted. eUnity does not leave any patient information on your workstation or web-browser.
>
> Exhibit 4.3

181. Similarly:

> Patient privacy is critical, and is something Client Outlook takes very seriously. eUnity does not leave any image or patient information on any device. All communication between the client and the servers are fully secure.

Exhibit 4.4

182. And again:

> Ensuring any solution you invest in keeps patient information private is very important and is something Client Outlook takes seriously. eUnity does not store any image data or patient information on any device, ever.
>
> eUnity supports auditing for all actions. As per HIPAA, audit information can be accessed and queried.

Exhibit 4.5

183. Additionally, upon information and belief, the eUnity viewer is described as an FDA-approved solution for providing the remote rendering functionality to healthcare providers:

> eUnity™, known as the most advanced and scalable diagnostic enterprise image viewing platform on the market, also supports primary diagnostic and radiology reading workflows. Radiologists can access, manipulate and collaborate over full diagnostic quality medical images with unparalleled performance and without the need for expensive GPU-based hardware. eUnity supports multiple monitors on any browser, hanging protocols, MIP/MPR & 3D and so much more. eUnity can be used to diagnose studies for all imaging modalities, including mammography, providing one viewing solution for the entire enterprise. Regulatory cleared for diagnostic use, with FDA 510k Class II clearance in the US as well as various other countries around the world, allowing radiologists to finally experience the same performance as a PACS workstation from a zero-footprint viewer.
>
> eUnity's unique architecture was designed based on two philosophies: quick access to data from any data source, and performance must meet and exceed your expectations. With eUnity's unique technology, you can quickly scroll and interact with data like a dedicated workstation, providing full diagnostic quality, even during image manipulation. eUnity is architected to remove concerns about network performance, regardless of your location.

Exhibit 4.6.1

184. Similarly:

> eUnityTM, known as the most advanced and scalable diagnostic enterprise image viewing platform on the market, also supports primary diagnostic and radiology

> reading workflows. Radiologists can access, manipulate and collaborate over full diagnostic quality medical images with unparalleled performance and without the need for expensive GPU-based hardware. eUnity supports multiple monitors on any browser, hanging protocols, MIP/MPR & 3D and so much more. Regulatory cleared for diagnostic use, with FDA 510k Class II clearance in the US as well as various other countries around the world, radiologists can finally experience the same performance as a PACS
> workstation from a zero-footprint viewer.
>
> …
>
> eUnity fully supports embedded MIP/MPR & 3D. You can reconstruct images on the fly, from any location because eUnity is not tied to specific hardware such as GPUs or workstations. eUnity is a smart platform, that is context aware and knows what measurement results you expect to see. The same measurement tool behaves appropriately based on the image type.
>
> You can collaborate with your peers using eUnity's true real-time collaboration. Most zero-footprint viewers with collaboration functionality do not offer diagnostic quality images to the participants. eUnity's unique technology allows you to share your screens and have diagnostic images for all users in the session, ensuring that any treatment decisions are always made on diagnostic images.
>
> Exhibit 4.6.2

185. Upon information and belief, the eUnity viewer is touted as providing full-quality images for healthcare professionals to access, manipulate, and collaborate in real time:

> eUnity™ is a server-based software solution that displays medical images and reports from a site's existing image archives (radiology, cardiology & other PACS and VNA systems). With eUnity™, healthcare professionals have a single, universal viewer & now healthcare professionals can access, manipulate and collaborate in real-time over full quality medical images using nothing more than a commonly configured web-browser.
> …
>
> Unlike other universal viewers, eUnity™ displays images at full-quality. When eUnity™ is used in your favorite web-browser on your MAC™ or Windows™ PC with an appropriate monitor for the pathology being viewed it's a flawless experience.
>
> …
>
> Supported by unique server technology, eUnity™ is the fastest enterprise viewer available today. Within the hospital, or across home DSL or cable network

connections, eUnity™ performs as well as installed software without sacrificing image quality. Even X-Ray angiography cine runs play at 30 fps while you window and level, zoom and pan.

Our server is the fastest and most efficient in its class too. Once installed it shields your existing PACS and VNA systems from 1000's of enterprise users. A single eUnity™ server supports 5x the number of active users than our closest competitor. eUnity™ also supports single servers scaled up or multiple servers scaled out for both performance in the 1000s and robust redundancy.

We have more patients than we've ever had before and not enough skilled resources to manage them. Worse, many patients have more than one condition. Demanding, more than ever, for healthcare professionals to act as a team in the care of their patients.

eUnity's™ collaboration services supports healthcare professionals to collaborate in real-time over a patient's medical images and reports. Image and report sharing can occur through a more natural, familiar experience. Helping to ensure remote-consultation, grand rounds, tumor boards and other collaboration occur helps support better patient care.

eUnity™ integrates with your existing systems. For example, PACS, VNA, other image archives, EMR & EHR systems, patient & provider portals, authentication systems can all be brought together with a single viewer for medical images. Health professionals benefit from improved access through a single, common viewer throughout the healthcare enterprise.

…

When the web browser or mobile application is closed, all images and information are gone from the device and reside only on the server, ensuring a secure environment. eUnity™ does not store images on any user's device.

eUnity™ leverages many healthcare IT standards including clinical (HL7, DICOM), frameworks (IHE) and infrastructure and technology standards (LDAP, RADIUS (SSO), HTTPS, HTML, HTML5, CSS, XML, web services, etc.). IT departments can integrate eUnity™ with their existing infrastructure and applications without sacrificing clinical workflow.

Exhibit 4.7

186. Upon information and belief, the eUnity viewer minimum hardware and platform requirements are described as follows, indicating minimal local resources and relying on use of web browsers:

Minimum requirements for web client for enterprise and cloud
When eUnity is used as an Enterprise or Cloud Viewer, the following are minimum PC requirements:

HTML5
Operating system
Windows® 7, Windows® 8/8.1, Windows® 10, MacOS® X 10.9+ (Intel)

Supported browsers
While eUnity stores no patient information on the client machine, we do recommend closing the browser when finished viewing images.
Safari 10+, IE11*+, Firefox 42+, Chrome 53+, Edge 44+

Hardware
Modern x64 Consumer CPU
Intel i3** or equivalent
2+ Cores @ 1.5Ghz+
4096 MB of RAM
512MB+ of graphics memory
10Mbit or higher network speed
4G/LTE+ (cell network speed)

Note: Some default browser configurations are known to improperly handle the HTTP/1.1 no-store cache directive and cache information to the local disk. During site validation the enterprise browsers and configurations should be validated to ensure patient data is not unexpectedly cached.

Exhibit 4.13.0

187. Similarly, upon information and belief, the eUnity viewer recommended hardware and platform requirements are described as follows:

Recommended requirements for web client for enterprise and cloud
When used as an enterprise or cloud viewer, the following are recommended PC requirements:

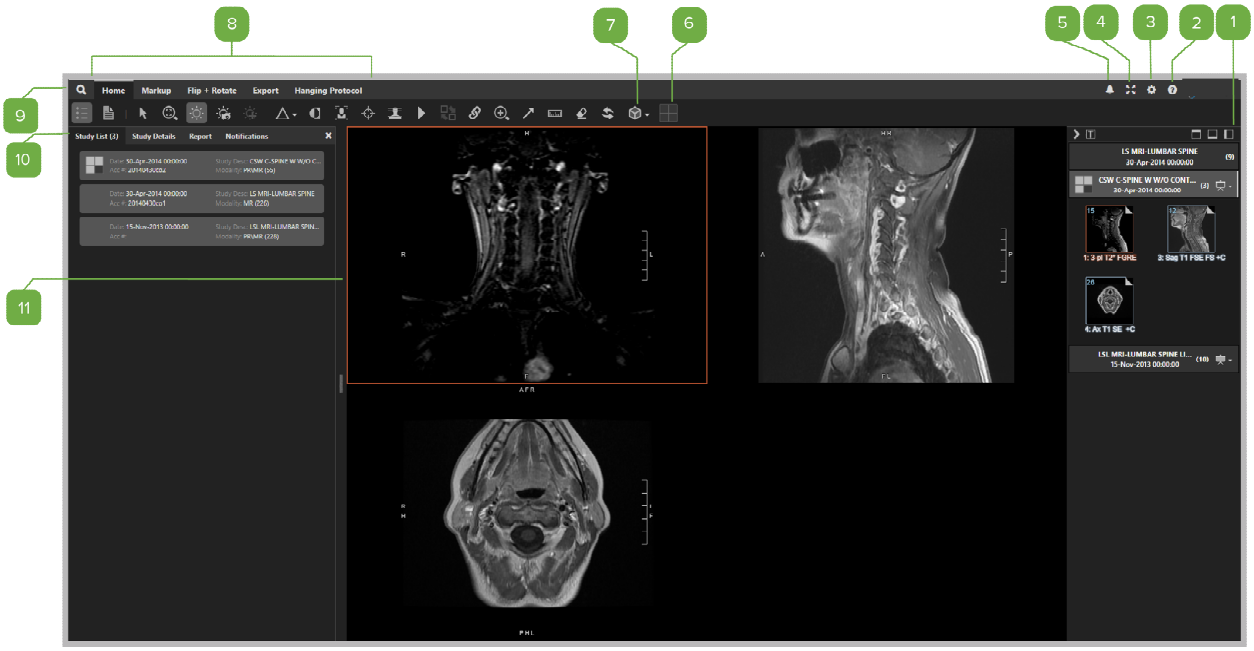
HTML5
Operating system
Windows® 7, Windows® 10, MacOS® X 10.12+

Supported browsers
While eUnity stores no patient information on the client machine, we do recommend closing the browser when finished viewing images.
Safari 12+, Chrome 70+, Latest iOS Safari, Android Chrome

Hardware
Modern x64 Consumer CPU
Intel i5* or equivalent
4+ Cores @ 1.5Ghz+
8192 MB of RAM
Dedicated Graphics Card (Nvidia or ATI)
DirectX 12 Compatible
2GB+ of dedicated graphics memory
30Mbit or higher network speed
4G/LTE+, 5G (cell network speed)

Exhibit 4.13.0

188. Upon information and belief, an overview of the eUnity viewer describes the following functionality and options:



1 Series Tray
The Series Tray shows the available series for a study. From here, the series can be opened in the viewing area.

2 Documentation
Click to open the User Guide.

Settings panel
Click to open the Settings panel. Note that the Settings panel and each tab within the panel must be enabled by the system administrator.

General tab: Select options for saving presentation states (Annotations / Markup, Window / Level, Spine Labels) and Key Images.
Hanging Protocol tab: Edit hanging protocols
Toolbar tab: Edit the toolbar
Context Menu tab: Edit the context menu

Full Screen mode
Expand the viewer to fill all available monitor space.

Notifications
When a study is updated, the bell displays a red indicator to alert you that the study has changed.

Screen Layout
Change to Study Compare mode, or change the number or monitors and viewports.

Advanced Visualization Workflows
Access Advanced Visualization workflows such as 3D, MPR, MPR Advanced, and Fusion.
Note: This feature requires a separate license and may not be available. Contact your system administrator to have this feature licensed and enabled.

Tool tabs
Tools are categorized into different tabs. Tabs such a Spine Labeling, Mammography, and Advanced Visualization become available when these modes are activated.

Search screen
Access the eUnity Search screen.

Study Information panel

This panel contains information grouped into the following tabs: Study List, Study Details, Report, and Notifications. These panels can be enabled or disabled by the system administrator.

Viewport
Viewports are the individual partitions in the viewer. If a viewport is selected, it is outlined in orange. Double-click a viewport to enlarge the image and show it in one-up layout. Double-click again to return the viewport to its previous layout.

Exhibit 4.13.7

189. Additionally, upon information and belief, an overview of the tools in the eUnity viewer are described as follows:


Clip Box
The clip box can be adjusted by dragging within a specific side. Drag down to move the plane into the volume (cut more). Drag up to move the plane out of the volume (cut less). electing one of the edges of the clip box the orientation of the clip box can be changed without changing its size or the orientation of the volume.

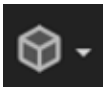

Cut Plane
Rotating the 3D volume to a desired view and click the Cut Plane icon. A cut plane normal to the current 3D view will be created. While in the cut plane mode, the cut plane can be moved into the volume by dragging the mouse down or out of the volume by dragging the mouse up.


Scalpel Tool
Remove or isolate a section of an image by dragging the mouse along the border of the area to segment then clicking on the region you would like to keep.


Curved MPR
In Advanced MPR mode, click along the anatomy in one of the viewports and the curved MPR is created in the lower-right viewport. Each point in the curve is along the center axis of the curved MPR view.


Create oblique
Every viewport is annotated with a color that directly corresponds to the reference line on other intersecting images in other viewports. To generate new planes, drag

the controls corresponding to the color of the viewport you wish to change until desired orientation is achieved.

 Advanced Visualization modes
Select Advanced Visualization modes such as 3D, MPR, Advanced MPR, and Fusion. Note that the options in this menu are enabled / disabled depending on the active study or series type.
Note: This feature requires a separate license and may not be available. Contact your system administrator to have this feature licensed and enabled.

 Advanced Visualization Parameters
View or change render types, render parameters, or SUV parameters. The tabs / options that are available in the panel depend on the visualization mode (i.e. Fusion vs 3D) and the series type (i.e. PET vs CT) or series orientation (i.e. same plane as the original series or not) that is selected in the viewer.

…

 Share this Session
Share your screen with other participants across all supported eUnity platforms (desktop web browser and mobile devices).

…

 Export image to JPEG / PNG
Export an image to your local device in JPEG or PNG format.

…

 Advanced Visualization Parameters
View or change render types, render parameters, or SUV parameters. The tabs / options that are available in the panel depend on the visualization mode (i.e. Fusion vs 3D) and the series type (i.e. PET vs CT) or series orientation (i.e. same plane as the original series or not) that is selected in the viewer.

 Fusion Blending
Left-click and drag the mouse up or down to increase or decrease the PET opacity. Increasing the opacity shows more of the functional (metabolic) data

from the PET. Decreasing the PET opacity shows more of the anatomical data from the CT.

 Fusion Presets
Apply presets such as Hot Iron to fused PET / CT studies so that the metabolic data of the PET information is assigned a preset pseudo color value from the Color Look Up Table (CLUT).

 Point Tool
Measures the exact value for a specific point. The unit of measure depends on the modality type. For example, in PET images it provides the SUV value, and in CT images it provides the Hounsfield units.
Note that when using the Point Tool on reconstructed series, measurements can be made only on series that match the acquisition plane (typically axial).

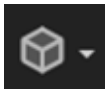
 Circle ROI
A single left-click starts the measurement and a second left-click ends the measurement. To edit, select the measurement to be active and then drag the measurement handles. The source of the calibration is shown in brackets at the bottom of the overlay.

Exhibit 4.13.8

190. Furthermore, upon information and belief, the eUnity viewer advanced visualization capability is described as follows:

If enabled in eUnity, the Advanced Visualization menu is available to create MPR, Obliques, Curved MPR, and 3D Volume Rendered views.

…

Click  and select the desired view mode. The differences between the modes is explained below.

MPR
Advanced MPR
3D

MPR
These layouts will generate axial, sagittal, and coronal planes from the selected series and display them in 3 horizontal or 3 vertical views. Slice navigation in this

mode is similar to 2D stack navigation (e.g. mouse wheel and drag advances by the slice thickness).

Advanced MPR
These layouts will generate axial, sagittal, and coronal planes from the selected series, and also provide advanced features such as change slice thickness, change rendering type, and create oblique / non-orthogonal stacks, or create a curved MPR.

3D
These layouts will generate axial, sagittal, and coronal planes from the selected series, and will also show a 3D volume rendered stack in one of the viewports.

Interactive mode in MPR / 3D view modes
Interactive mode is a special low-latency mode that prioritizes frame-rate and is enabled in fast operations such as adjusting Window Level on the fly, navigating the stack, or adjusting the 3D image render function or volume orientation on volume rendered stacks.

Note: Viewports in Interactive mode will display  in the upper-right corner of the viewport to indicate that higher quality images are in progress.

For information on adjusting the quality of interactive or final images, see Advanced Visualization Parameters for 3D and MPR.

Exhibit 4.13.1

191. Similarly, upon information and belief, the eUnity viewer advanced visualization parameters are described as follows:

Advanced Visualization Parameters

View or change render types, render parameters, or SUV parameters. The tabs / options that are available in the panel depend on the visualization mode (i.e. Fusion vs 3D) and the series type (i.e. PET vs CT) or series orientation (i.e. same plane as the original series or not) that is selected in the viewer.

Render Parameters tab
Change the quality of interactive or final images
The Interactive Quality and Final Quality options scale up or scale down the quality of interactive images (images generated during on-the-fly rendering) and final images (images generated at rest, when no user commands are applied to the volume stack).

Click  and click the Render Parameters tab.
Click and drag the handle on the Interactive Quality or Final Quality scales.

Change the slice thickness
Click a volume rendered image.
Click  and click the Render Parameters tab.
Click and drag the handle on the Slice Thickness slider.

Render Types tab
The Render Types tab is available when you select an axial, sagittal, or coronal reconstruction in an MPR, Advanced MPR, or 3D layout.

Change the render type
Click  and click the Render Types tab.
Select one of the following render types:
Maximum Intensity Projection (MIP)
Minimum Intensity Projection (MinIP)
Faded Maximum Intensity Projection (Faded MIP)
Average Intensity Projection (Average)

Exhibit 4.13.2

192. Upon information and belief, the eUnity viewer advanced MPR tools are described as follows:

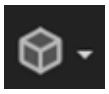
 Curved MPR

In Advanced MPR mode, click along the anatomy in one of the viewports and the curved MPR is created in the lower-right viewport. Each point in the curve is along the center axis of the curved MPR view.

 Create oblique

Every viewport is annotated with a color that directly corresponds to the reference line on other intersecting images in other viewports. To generate new planes, drag the controls corresponding to the color of the viewport you wish to change until desired orientation is achieved.

Turn on Advanced MPR mode

Click  and click Advanced MPR.
On the MPR / 3D tab, click an Advanced MPR layout:

- Advanced MPR with oblique 2 x 2 layout

- Advanced MPR with oblique custom layout

Create a curved MPR view
The curved MPR view is created in the bottom right cell. The current orientation angle is shown by the  icon . Click this icon to reset the orientation angle back to the original. Click  to toggle the points and line on and off.

Click 
Click in any of the other views along the desired anatomy. Each point will be along the center axis of the curved MPR view.
Click in the curved MPR view to synchronize the three orthogonal views to the selected point.
Drag the mouse in the curved MPR view to rotate the image about the axis of points.

Exhibit 4.13.3

193. And upon information and belief, the eUnity viewer 3D tools are described as follows:

 Clip Box

The clip box can be adjusted by dragging within a specific side. Drag down to move the plane into the volume (cut more). Drag up to move the plane out of the volume (cut less). electing one of the edges of the clip box the orientation of the clip box can be changed without changing its size or the orientation of the volume.

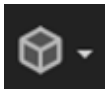
 Cut Plane

Rotating the 3D volume to a desired view and click the Cut Plane icon. A cut plane normal to the current 3D view will be created. While in the cut plane mode, the cut plane can be moved into the volume by dragging the mouse down or out of the volume by dragging the mouse up.

 Scalpel Tool

Remove or isolate a section of an image by dragging the mouse along the border of the area to segment then clicking on the region you would like to keep.

Turn on 3D mode

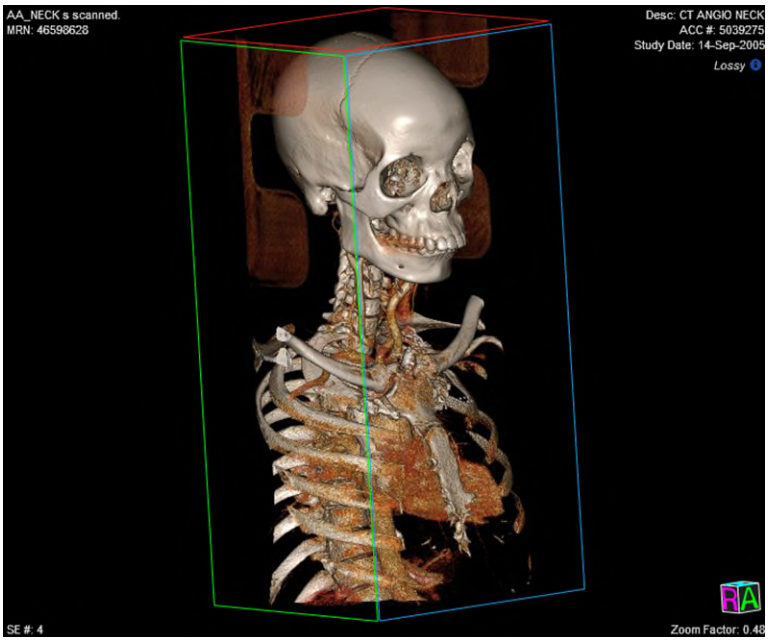
Click  and click 3D.
On the MPR / 3D tab, click a 3D layout:

 - 3D with 3 MPR views

 - 3D with custom layout

Clip Box
Use the Clip Box tool to cut away some of the volume so that you can better see underlying anatomy. Each plane is represented with a colored border. Click outside the edges of the clip box and drag to change the orientation of the clip box without changing its size or the orientation of the volume.

On the MPR / 3D tab, click 
Click within one of the sides and do either of the following:
Drag into the volume (cut more).
Drag out of the volume (cut less).



Cut Plane

Use the Cut Plane tool to cut away some of the volume at a custom rotation.

Rotate the 3D volume to a desired angle.

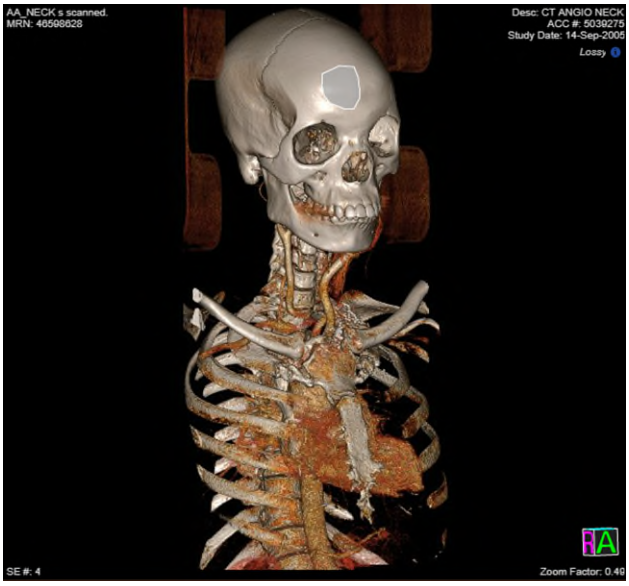
On the MPR /3D tab, click  . A cut plane normalized to the current 3D view is created.

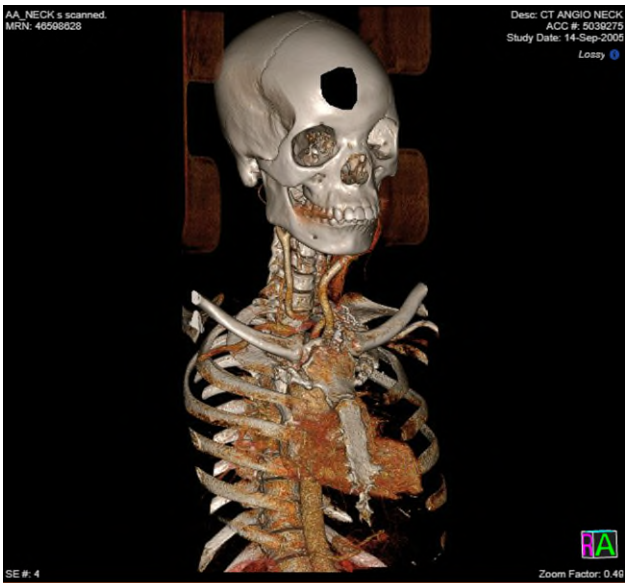
Drag the mouse down to move the cut plane into the volume.
Drag the mouse up to move the cut plane out of the volume.

Scalpel
Use the Scalpel tool to remove or isolate a segment of the image.

On the MPR / 3D tab, click 
Drag the mouse along the border of the area you wish to segment. Once the desired region has been selected you should see the selection similar to the first image below.
Click on the region you would like to keep. For example, clicking outside of the segment will remove the selected region and the result will be similar to the second image below.

This process can be repeated for multiple regions. The reset tool will revert all segments.





Adjust the rendering presets
The rendering preset can be adjusted on-site and may differ from the default. Changing the presets will re-render the volume, highlighting different features, or even completely changing the method or type of rendering.

Select the 3D view.

Click  and click the Presets tab.
Click a rendering preset.

Exhibit 4.13.4

194. Upon information and belief, the eUnity viewer Presentation States are described as follows:

eUnity supports display of DICOM Greyscale Softcopy Presentation State (GSPS) and Color Softcopy Presentation State (CSPS) objects. These objects can alter the display of an image by changing Window Level, zoom factor, shutters, or markup.

 Presentation State Applied indicator
Shown in the viewport to indicate that a presentation state is applied.

 Presentation State Available indicator
Shown in the study pill in the Series Tray to indicate that presentation states are available. Click the arrow to show the available presentation states.

Apply a Presentation State

By default, the newest Presentation State will automatically be applied to a study. When a Presentation State exists for a study, the study pill in the Series Tray will include a Presentation State context menu  . The label displayed in the menu comes from the presentation name and may include one or more related Presentation State instances.

Open a study that has available Presentation States in the viewer.

To activate or disable Presentation States, click  in the Series Tray.
Click the Presentation State that you want to apply. To remove all Presentation States, click None .

When an image has a Presentation State applied, the  indicator appears in the viewport. As well, the indicator on the study pill in the Series Tray changes from  to  .

Note: When exporting images, any Presentation State-related markup will not appear on the image.

Exhibit 4.13.5

195. Furthermore, upon information and belief, the eUnity viewer Window Level function can be manually changed as follows:

Manually change the Window Level
The Window Level operation can be mapped to middle-mouse button or right-mouse button by the system administrator.

Click  to turn on the Window Level tool.
Click and hold the left mouse button in the viewport.
Drag the cursor up and down to adjust Window Level.
Drag the cursor left and right to adjust Window Width.

To get fine Window Level control, press and hold the CTRL key while you drag. The Window Level will be adjusted in smaller increments.

To reset the Window Level to its initial presentation, click 

Exhibit 4.13.6

196. Upon information and belief, the eUnity viewer lossy compression indicator is described as follows:

Lossy compression indicator
Shown in the viewport to identify the image data as lossy and summarize the compression ratio. Hover the cursor over the to display the following information:

the type of image compression
the compression ratio
derivation description, if one exists

If the image has multiple compression types and ratios, the tooltip displays all known type / ratio combinations.

Lossy compression indicator (reformatted and rendered views)
WARNING
All reformatted and volume rendered views (MPR and 3D) are treated as Lossy and will always display a Lossy indicator.
In MPR, 3D , and Fusion modes, hover the cursor over the to display the final JPEG render quality.

Exhibit 4.13.9

197. And upon information and belief, the eUnity viewer export function is described as follows:

Export an image in PNG or JPEG format. Only demographics that are burned in to the image are exported. That is, demographic overlays and user-added annotations are not exported.


Export image to JPEG / PNG
Export an image to your local device in JPEG or PNG format.

Click the image to export.

On the Export tab, click  Export button
In the Export Image dialog, click either JPEG or PNG. If you choose JPEG, adjust the quality slider to increase or decrease the image quality.
Click Export. The file is exported to your default Download folder.

Exhibit 4.13.10

198. Upon information and belief, the eUnity viewer utilizes a URL for server identification and to authenticate users during login:

> eUnityTM SMIL PACS Viewer displays diagnostic quality images and is compatible with most commonly configured browsers on MACTM or WindowsTM PC, plus point-of-care mobile devices (iPhone, iPad and Android).
> To get started
> 1.You must first have an activated account, a user name and temporary password (for more information go towww.esmil.com =>Physician Services=>PACS Registration Form or call 480-425-5019).
> 2.To access eUnity using a mobile device your first log in must be through a desk top.
> 3.Type the URL https://eunity.sdil.net into your desk top browser.
> 4.Enter your username and temporary password.
> 5.You will be prompted to enter a new personalized password. You will see a message stating “Invalid Username and/or Password”. Simply re-enter your username and new password. If you need assistance call SMIL IT 602.521.6373

Exhibit 4.14.3

199. Similarly:

> Launch and login to eUnity™
> Notice: User must have a valid Main Line Health user account to log into the System.
>
> …
>
> Authentication

At the eUnity login screen:
1. Type your Main Line Health Network User ID and Password.
2. The password is case-sensitive. If you cannot login, check whether Caps Lock is enabled on your keyboard.
3. Click Login.
4. The Search area will be presented, and you can begin using eUnity.

…

eUnity Direct Access
Physician Direct Access is available at https://eunity.mlhs.org. Enter your Main Line Health Network User ID and Password at the eUnity login screen, click Log In. If the login is successful, the Search screen is displayed.

Exhibit 4.14.1

200. And again:

Direct internet access: You may login to eUnity directly by navigating to https://eunity.mlhs.org and looking up the appropriate patient

Exhibit 4.14.2

201. Upon information and belief, the eUnity viewer allows authenticated users to search through their associated databases of patient information to locate particular patients to whom they have sufficient permissions to access:

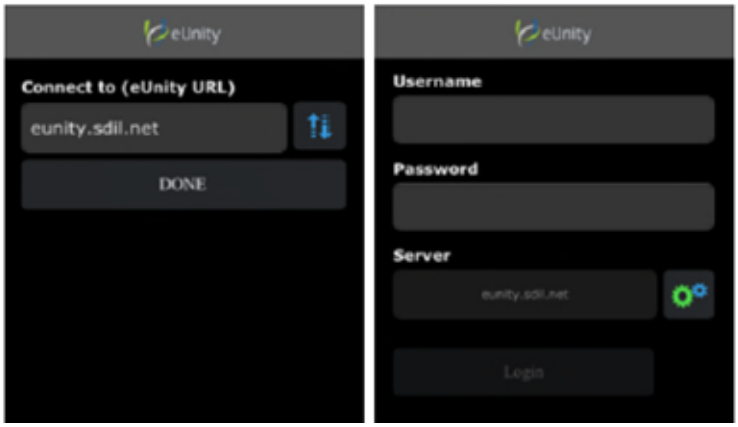
Patient Search
Enter any combination of patient related information to help you locate your patient.
When searching by Patient Name, use the format LASTNAME, FIRST NAME
Patient ID allows you to search for your patient by their Medical Record Number (MRN).
Accession Number allows you to search for your patient by using the exam's Accession Number (ACC#).

Exhibit 4.14.3

202. For example, upon information and belief, the eUnity viewer is described as providing the same authenticated login through a URL on mobile remote client devices:

Steps for Mobile Device Access* (you must have previously logged in through a desk top)

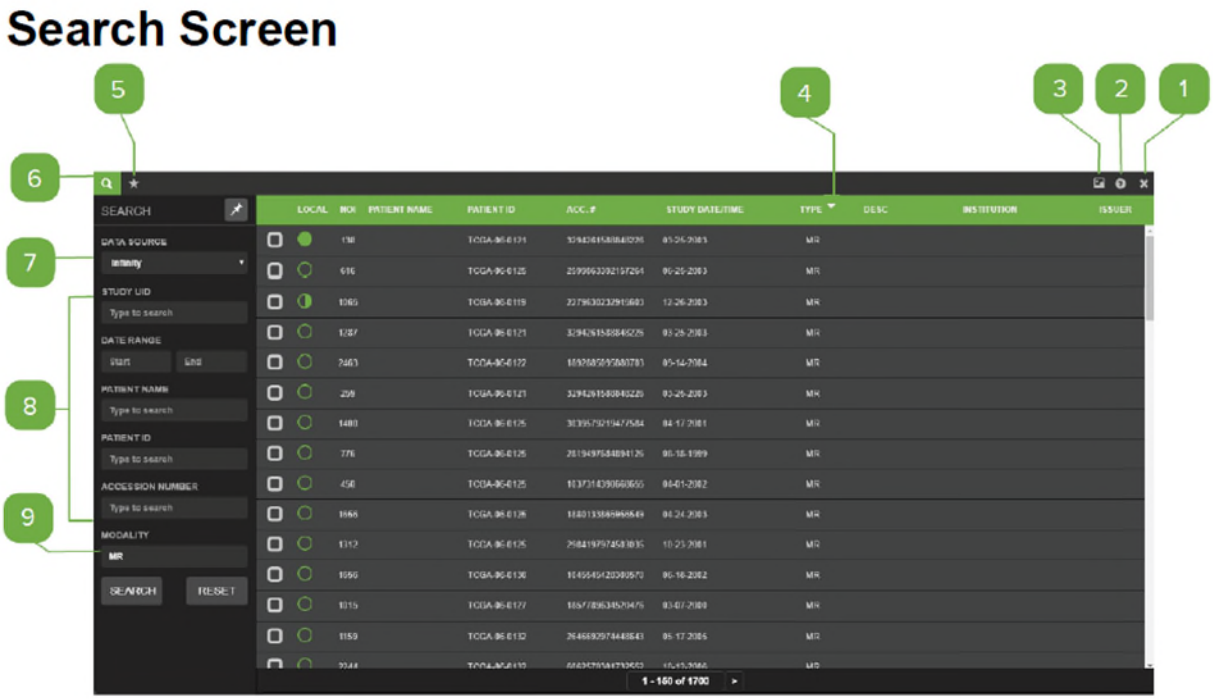
- Visit the App store for your device to download and install the eUnity application.
- To access with a mobile device begin by typing the server name eunity.sdil.net into the server section of the log in screen. The server name will automatically be remembered for future use. If your connection is not successful, make sure your data connection is strong or that you are connected to Wi-Fi.



Mobile Viewing
Once the study is launched in the viewing portion of the application, tools are presented across the top while the series tray is displayed on the bottom.
Users can single tap in the middle of the screen to bring up, or hide, more options. On the tablet this will include the top toolbar and the series tray. On the phone this displays pan and window/level mode selection.

Exhibit 4.14.3

203. Upon information and belief, the eUnity viewer search screen is depicted as follows:



1. Log out
2. Documentation
3. Change Search screen theme
4. Sort by column
5. Search templates
6. Hide or show the search panel
7. Data Source
8. Search fields
9. Modality filter

Exhibit 4.14.2

204. Upon information and belief, the eUnity viewer image screen functionality is depicted and described as follows:

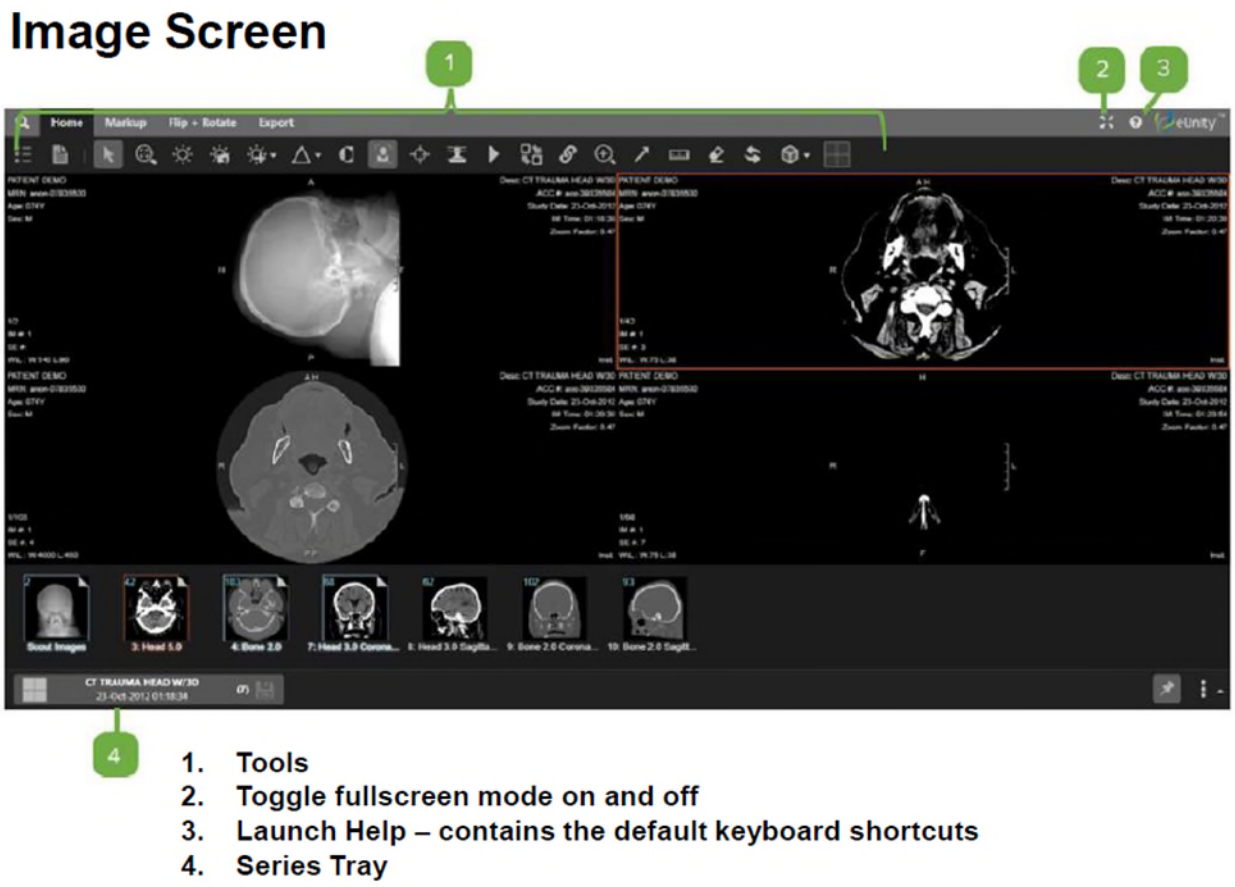
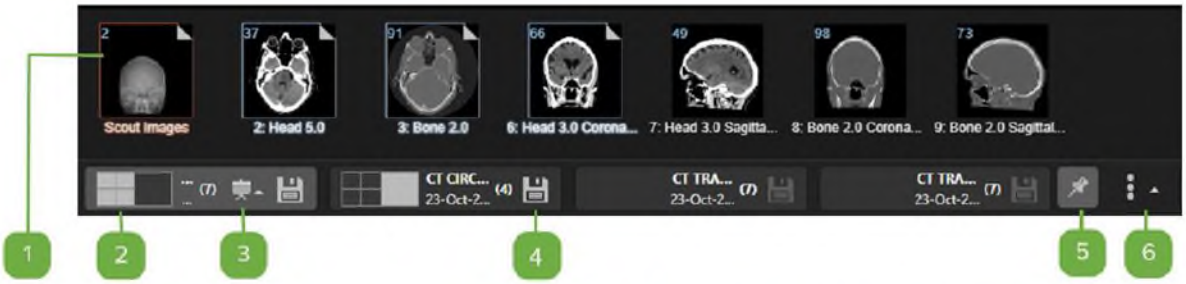


Exhibit 4.14.2

205. Upon information and belief, the eUnity viewer series tray functionality is depicted and described as follows:

Series Tray



1. **Thumbnail view** – the series that is currently active will be outlined in orange, the series that are in view but not active are outlined in blue. The folded corner indicates that at least one image was viewed in the series
   - Loading study from Study List
     - Double-click on a series or image on the Series Tray to load it on the active viewport (the viewport outlined in orange in the viewing area)
     - Alternatively, drag the series or image to the desired viewport
2. **Study position indicator** – shows the position of the study in the screen. If the study is not displayed on the screen, then it will not have a position indicator
3. **Presentation State** – allows users to toggle between different presentation states
4. **Save Presentation State** (if enabled) – allows the user to save markups
5. **Toggle Series Tray docking** – pins the available series so that they are always displayed
6. **Control Bar Location Selection** – The Series Tray can be located at the bottom, top, right, or left side of the screen.

Exhibit 4.14.2

206. Upon information and belief, the eUnity viewer Tools Home Tab functionality is depicted and described as follows:

Tools – Home tab

Once a study is selected, the images will display on the screen. There are several tabs along the top left corner of the screen, the tabs are listed below along with the tools in each tab. Image adjustments and markups are not saved by eUnity.

Icon	Tool	Description
	Study List	• Lists studies available for the patient (if configured)
	Report/Comment	• Report (if available and if configured) • Study comments
	Navigate	• Default tool • In Navigate mode, left-click and drag to scroll thorough images
	Zoom/ Pan	• In Zoom/Pan mode, use the mouse wheel or other scrolling tool to zoom into content • Left-click and drag to pan
	Window Level	• In Window Level mode, left-click and drag to adjust Window Level
	Reset Window Level	• Click the tool to reset Window Level
	Window Level Presets	• Click the dropdown for modality-specific Window Level Presets

Icon	Tool	Description
	Toggle Demographics	• This tool is on by default to display patient demographics and study data • Toggle off to remove demographics and study data
	Triangulation	• In Triangulation mode, hold down the left mouse button. The crosshair will indicate the corresponding point on other series within the study
	Toggle Reference Lines	• Reference Lines mode can be used with triangulation or alone to provide a reference line
	Series Reposition	• In Series Reposition mode, drag the series into different ports
	Navigation / Zoom and Pan Linking	• Select the tool to link multiple series together. Scroll, pan and zoom the series in unison • Hold the Alt key to scroll linked series independently • Series need to be within 5mm of each other to be linked

Icon	Tool	Description
	Magnifying Glass	• Click to magnify an area of an image.
	Arrow	• Select the tool, left-click to start and left-click to end the arrow or hold the left-click and drag
	Linear Measurement	• Select the tool, left-click to start the measurement and left-click to end the measurement or hold the left-click and drag
	Eraser	• Select the Eraser tool and click on a markup to delete it • Alternatively, select the measurement and hit the Delete key
	Revert to Original	• Click the tool to reset the active series to its original state
	Share This Session	• Collaboration tool used for screen sharing • Once Collaboration mode is activated, the connection indicator will turn green. Other users can see the cursor and changes made to the study if they 1) login to eUnity 2) view the same study and 3) activate "Share This Session" • Click  to exit collaboration. When the indicator turns red, you are no longer in collaboration mode.
	Screen Layout	• Allows the user to change the layout from single to double monitor (if enabled) and to select how each monitor is split • Each monitor can be split by images, series or studies • Use this tool to activate Study Compare mode

Exhibit 4.14.2

207. Upon information and belief, the eUnity viewer Advanced Visualization functionality is depicted and described as follows:

Advanced Visualization

- Allows users to create MPR, Advanced MPRs and 3D reformats
- All reformatted and volume rendered views (MPR & 3D) are treated as Lossy
- MPR, Advanced MPRs and 3D reformats are not saved by eUnity

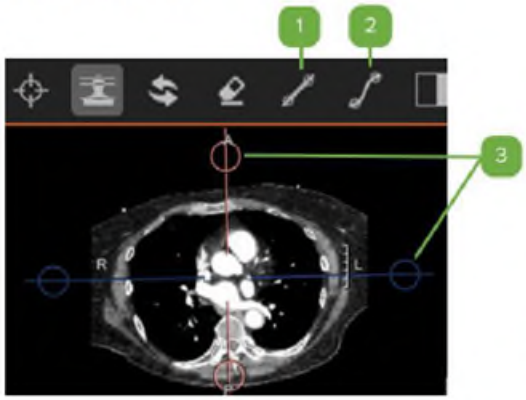
To use Advanced Visualization:

- Select a series from the Series Tray, then select one of the advanced visualization options
- Select screen format from the top left corner of the screen

- Select the configuration tool  to adjust the render type (MIP, MinIP etc.) and render parameters (quality and slice thickness)

MPR – create axial, sagittal and coronal reconstructions.

Advanced MPR



1. Select the "Create Oblique" and draw a line to create a reformat along that axis
2. Create Curved MPR tool – use the tool for vessel tracking. Select the tool and left-click along the vessel (scrolling as necessary) to create a curved MPR. Click on the curved MPR to obtain orthogonal views at the selected point
3. To create oblique views, click and drag the circles on series

3D

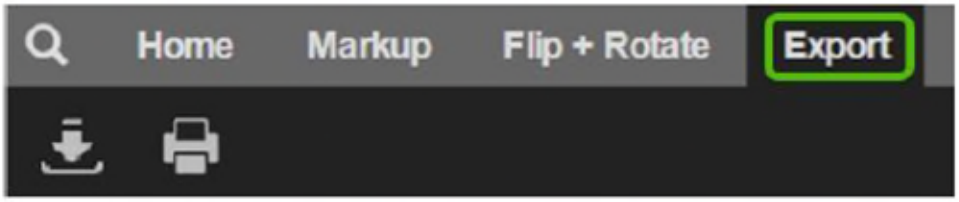
- Create 3D reformats. Left-click and drag to rotate the 3D
- Add or remove anatomy from the 3D using the 3 tools below:

1. Clip box tool – select the tool then adjust the box on any plane to remove anatomy
2. Cut pane tool – rotate the 3D to the desired view, select the tool and drag the mouse down to remove anatomy or drag the mouse up to add anatomy
3. Scalpel tool – select the tool, left-click and drag to select a region and click the region you want to keep

Exhibit 4.14.1

208. For example, upon information and belief, the eUnity viewer Export Tab functionality is depicted and described as follows:

Export tab



- Export images as JPEG or PNG
- Print images

Exhibit 4.14.1

209. For example, upon information and belief, the eUnity viewer requirements for the Web Client OS and Browser is depicted as follows:

	HTML5 Viewer
Operating System	Windows 7, Windows 10 Mac OS X 10.12+
Recommended Browsers	Safari 12+, Chrome 70+ Latest iOS Safari, Android Chrome

Table 2 - Web Client OS and Browser Requirements

Exhibit 4.14.1

210. Additionally, upon information and belief, the eUnity viewer includes at least code from the following subroutines in the WandManager and WandWebSocket files, indicating token authentication of an web client session:

public String getConnectionToken()
public static Handshake parse

211. Additionally, upon information and belief, the eUnity viewer includes at least code from the following subroutines in the WandViewFlipper and GestureListener files, indicating a web-based delivery of images rendered from a remote server:

private void initView
public void loadCompanionView()
private void endRotateGesture()
public boolean onScroll

212. Additionally, upon information and belief, the eUnity viewer includes at least code from the following subroutines in the WandActivity and WandViewFlipper files, indicating image caching and fetching of remotely rendered images:

private void initialize

public void drawImage(Bitmap bitmap)

213. Additionally, upon information and belief, the eUnity viewer includes at least code from the following subroutine in the AndroidWebView file, indicating clearing or flushing of internally cached images:

public void destroyInternals()

H. Overview of Infringing Aspects of the Calgary Scientific Viewer in Nuance PowerShare

214. Upon information and belief, Nuance PowerShare has integrated with and offered the ResolutionMD viewer as part of its functionality to healthcare professionals and users.

215. For example, upon information and belief, the ResolutionMD viewer is described as providing server-side rendering of patient information:

> Get 2D, MIP/MPR, and 3D images quickly and reliably when you need them. Reduce time to diagnosis. With CPU or GPU-based server-side rendering, your 2D, MIP/MPR and 3D files are rendered at the highest performance.
>
> Exhibit 3.18

216. Similarly, upon information and belief, the ResolutionMD viewer is described as providing remote visualization of patient imaging data from anywhere over a web browser:

> Diagnose on mobile and web. Globally accredited using various devices and browsers.
> View and diagnose from anywhere. Fully-featured for mobile and web with USA FDA clearance, as well as other global accreditations. Use 2D viewing, as well as advance visualizations like MIP, MPR, and 3D. Specialized precision tools for mobile and web measurements.
>
> Exhibit 3.18

217. Upon information and belief, the ResolutionMD viewer is described as maintaining secure access and patient data security despite access to healthcare providers for remote visualization:

> Any medical image on any device, anytime anywhere

> Our award winning mobile visualization platform empowers healthcare professionals to collaborate and diagnose while viewing and sharing 2D/3D images on any device.
>
> Get secure access to your data from anywhere, without moving or copying your data. Chosen and trusted by the largest and most-demanding healthcare institutions worldwide.
>
> Exhibit 3.4

218. Additionally, upon information and belief, the ResolutionMD viewer is described as providing secure collaborative functionality with others for remotely rendered images, as well as AI integration:

> ResolutionMD by PureWeb
> Collaborate and confer while interacting with diagnostic results
> Features:
> - Securely view & interact with 2D/3D images
> - Supports DICOM and non-DICOM
> - Experience on any device, anywhere, anytime
>
> …
> Live collaboration for healthcare
> Breaking down barriers to improve patient care
> PureWeb enables:
> - multidisciplinary team collaboration without sharing any source files
> - image intense applications and critical patient data
> - 360° patient data access
> - participants to share multiple applications simultaneously
> - built in audio, video
>
> Contact us for custom integrations:
> - easily share workstation locked applications
> - enable artificial intelligence (AI) integration and cloud deployment
>
> Exhibit 3.4

219. Upon information and belief, the ResolutionMD viewer is described as providing a browser-neutral viewer that includes HTML5 for web applications:

> Browser-neutral viewer
> Quick access to information regardless of browser (new or old), hospital infrastructure or policies currently in place. Client options include HTML5, flex for the web and native mobile applications.

Exhibit 3.3

220. Also upon information and belief, the ResolutionMD viewer is described as providing additional visualization functionality including 3D volume rendering on a zero footprint and mobile environment:

> MPR and 3D
> Maximum Intensity Projection (MIP) views for better evaluation of vascular structures. Reconstruct multiple planes from a single CT or MR dataset allows the reporting physician to view anatomical structures from different aspects. 3D Volume Rendering rounds out the advanced viewing and processing features, all done in a zero-footprint and mobile environment.

Exhibit 3.3

221. Upon information and belief, the ResolutionMD viewer utilizes a secure URL with data encryption to access the remotely rendered patient information:

> Secure URL launching
> Data encryption is used to securely create URLs for launching studies from third party applications, including Epic's EMR system

Exhibit 3.3

222. Additionally, upon information and belief, the ResolutionMD viewer is described as providing a secure dynamic URL integration:

> Access patient image data directly in multiple EHR/EMR systems, and from other archives. ResolutionMD can be securely integrated into EHR/EMR systems such as Epic, Cerner, Allscripts and others. Secure dynamic URL integration is used to launch the ResolutionMD viewer directly with patient/study context to streamline image-viewing workflows.
> ...
> Tiered archive searching. ResolutionMD gives administrators the ability to organize DICOM repositories into prioritized tiers. Data loading requests for a targeted study (i.e., URL-launch with a specific Study Instance UID) will be executed progressively against each tier of archives. Once the study is located, no queries are made to the remaining archives, thereby reducing the network traffic and load on slower archives.

Exhibit 3.1

223. Similarly, upon information and belief, the ResolutionMD viewer is described as providing a HIPAA compliant system that preserves confidentiality of patient data despite permitting remote access for visualization:

> ResolutionMD® is completely HIPAA compliant. If providers lose devices, no patient information can be mined or exposed:
> • Unique patented technology ensures patient data remains behind your firewall.
> • Server-side rendering efficiently manages large data sets.
> • Your IT Administrators control what users can access.
> • Ensures all your PHI data remains HIPAA compliant.
>
> Exhibit 3.3

224. Similarly, upon information and belief, the ResolutionMD viewer is touted as working with existing security practices in a healthcare environment to preserve network and patient information security:

> Ensuring the security of information and applications is a critical priority for all organizations, particularly those in the field of healthcare. When operating in an environment of thorough security practices, the architecture, features and services of ResolutionMD enable medical images and information to be securely and conveniently accessible to users from anywhere in the world, without compromising network or information security.
>
> Exhibit 3.5

225. Additionally, upon information and belief, the ResolutionMD viewer is described as providing secure access to patient data without moving or copying information from the server-side storage, which is behind a firewall and authentication schemes:

> Secure access to patient data from anywhere, without moving or copying data. Maintain data server-side, behind the firewall. Server-side rendering means patient data is never copied or moved to any device. Administrators control end-user authentication and viewing access for studies.
>
> Exhibit 3.1

226. Upon information and belief, the ResolutionMD viewer is touted as adding

multiple layers of security and data protections:

> 1. No patient data is actually left persistent on the client mobile device or browser session. Once a session times out or is ended, the data in memory is deleted and no data is persistent on the device. If a phone or tablet is lost or stolen there is no concern about patient data being left behind and accessible.
> 2. The ResolutionMD server is set up to require clients to enter login credentials for production use
> 3. The ResolutionMD client is typically further secured with the use of SSL. SSL implemented in conjunction with the ResolutionMD Server ensures that all data transmission between the client device and the server are encrypted so as not to be interpreted while in transit from a network.
> 4. Optionally, a VPN can be added as a secure conduit through which the end user device can communicate with the ResolutionMD server.
>
> Exhibit 3.2

227. Additionally, upon information and belief, the ResolutionMD viewer is described as querying images on demand and remotely rendering the data on the server side for delivery to the client device:

> Images are queried from the PACS on demand, with no images being stored on the ResolutionMD server. Images are then rendered and made available for display to the end user device. This keeps the patient data safe behind the firewall. Users are authenticated against the site LDAP for full integration into IT policies.
>
> Exhibit 3.2

228. For example, upon information and belief, the ResolutionMD viewer is touted as securely providing remotely rendered patient images on an FDA-approved system:

> ResolutionMD enables doctors to securely view patient images and reports from a wide variety of computers and mobile devices, collaborate with other practitioners and diagnose from any location. Whether you are a single facility or a large healthcare system with tens of thousands of users, ResolutionMD is the best choice for seamless image access across multiple departments. The FDA cleared, CFDA registered, Health Canada licensed and CE marked mobile medical diagnosis software can be integrated into any EMR and easily plugs into existing distributed storage systems. ResolutionMD's federated approach is an important differentiator from other solutions as highly sensitive data is never moved to a device and no additional data storage locations are created.
>
> Exhibit 3.2

229. Upon information and belief, the ResolutionMD viewer is described as providing an enterprise image viewing solution designed for web applications, using HTML5 and a zero footprint client option:

> A state-of-the-art enterprise image-viewing solution, ResolutionMD® was purpose-built for web and mobile devices:
> • Accesses diagnostic-grade images and other patient information on any mobile device.
> • Single software platform providing zero-footprint client options that include HTML 5, flex for the web as well as native mobile applications (iOS and Android).
> • Properly supports all screen sizes, from smartphones to tablets and laptops.
>
> Exhibit 3.3

230. Similarly, upon information and belief, the ResolutionMD viewer does not require specialized equipment and can utilize off-the-shelf servers for the server-side rendering and web browsers for the client-side visualization:

> ResolutionMD® software is an enterprise medical image viewer used with off-the-shelf servers, web browsers, and specific mobile devices for the 2D display, Multi-planar reformatting and 3D visualization of medical image data and reports. It provides collaboration and integrated secure audio-video communication, and displays DICOM and non-DICOM medical images and reports.
>
> Exhibit 3.16

231. Upon information and belief, the ResolutionMD software uses off-the-shelf servers and web browsers with HTML5 to deliver remotely rendered images (2D and 3D) to healthcare professionals:

> ResolutionMD® software is an enterprise medical image viewer used with off-the-shelf servers, web browsers, and specific mobile devices for the 2D display, Multi-planar reformatting and 3D visualization of medical image data and reports. It provides collaboration and integrated secure audio video communication, and displays DICOM and non-DICOM medical images and reports. ResolutionMD is intended for use as a diagnostic, review, and analysis tool by trained healthcare professionals to drive clinical management. When interpreted by a trained physician, reviewed images may be used to aid in diagnosis. When used on a

> mobile device, ResolutionMD is not intended to replace full radiology workstations.
> …
> The ResolutionMD HTML5 client is accessed through a browser on your desktop or mobile device. ResolutionMD is intended for diagnostic use from specific mobile devices and browsers.
> …
> The ResolutionMD® software is accessible on devices via an Internet connection from a browser (Chrome, Safari, Internet Explorer or Firefox).
>
> Deployment Model
> The ResolutionMD® software enables you to conveniently view medical images via a web browser. Images are acquired from a connected PACS or medical image archive and loaded into memory on a centralized ResolutionMD server. You interact with the server-based application via a browser to view the images.
>
> Exhibit 3.7

232. Similarly, upon information and belief, the ResolutionMD viewer is described as using general purpose computing servers and common client-side mobile devices:

> Device Description:
> The ResolutionMVDM Mobile 3.1 software is a software-based Picture Archiving and Communication System (PACS) used with general purpose computing servers and high-resolution Apple Inc. 05S and Google Inc. Android OS-based wireless mobile devices for the display and advanced visualization of medical image data. It provides for communication, storage, processing, rendering on the server and the display of DICOM 3.0 compliant image data derived from CT and MRI on the mobile device.
> …
> Indications for Use:
> The ResolutionMDM Mobile software is a software-based Picture Archiving and Communication System (PACS) used with general purpose computing servers and specific mobile devices. it provides for communication, storage, reformatting, rendering on the server component and communication and display of DICOM 3.0-compliant CT and MR medical images as well as reports on the mobile device.
>
> Exhibit 3.15

233. Upon information and belief, the ResolutionMD viewer is described as providing diagnostic, review, and analysis tools for healthcare professionals to access and view remotely rendered patient imaging data:

> The ResolutionMD Mobile provides wireless and portable access to medical images. The device is intended for use as a diagnostic, review, and analysis tool by trained professionals such as radiologists, physicians and technologists. This device is not intended to replace full workstations and should be used only when there is no access to a workstation.
> …
> Technological Characteristics
> The ResolutionMVD TM Mobile 3.1 software adds support for mobile devices running the Android operating system and has the same uses and applications as the predicate device. Both the device and predicate are used by the clinician as a diagnostic, review, and analysis tool for radiological images.

Exhibit 3.15

234. Upon information and belief, below is a high-level architecture of a single instance of ResolutionMD with typical infrastructure components:

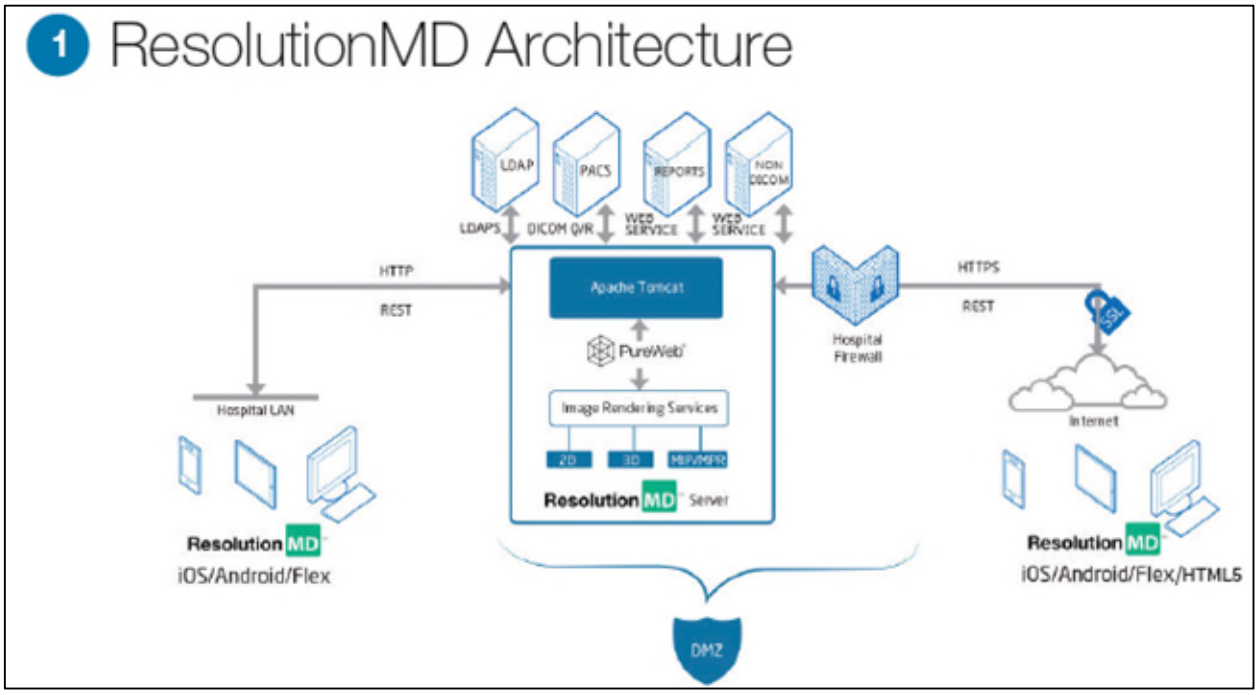


Exhibit 3.5; *see also* Exhibit 3.2

235. Upon information and belief, the ResolutionMD viewer web server schematic is depicted as follows:

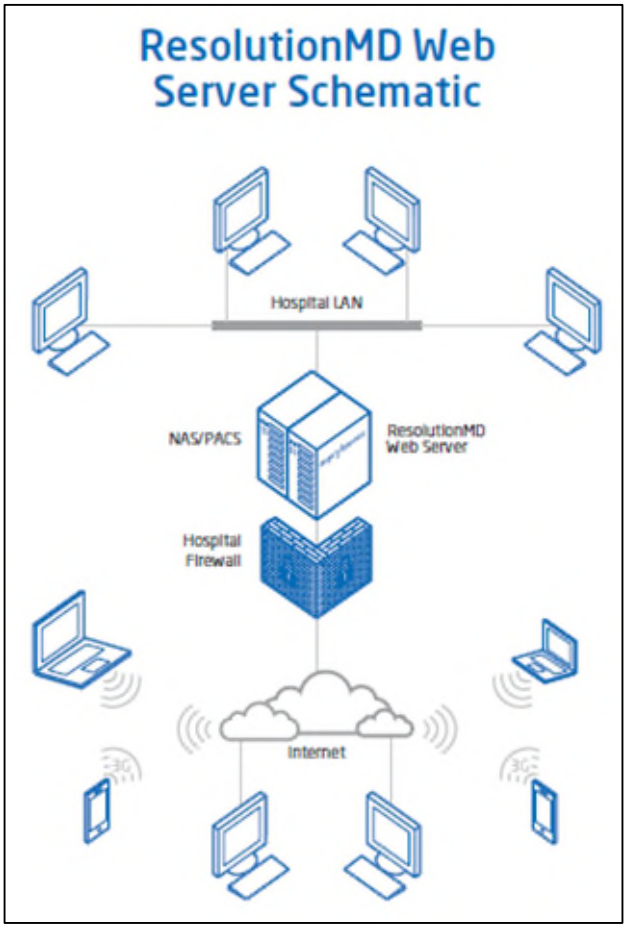


Exhibit 3.0

236. Additionally, upon information and belief, the ResolutionMD viewer is described as providing Window and Level presets, cross-section, manipulation, and intensity changes that can be applied to the remote rendering of stored patient imaging data:

> Window/Level Presets. Choose from a variety of preset values to quickly set the window width and level to a desired setting....
>
> Invert Window/Level. Invert the grayscale intensities on an image for an alternative contrast to the acquired image.
>
> …
>
> MIP/MPR. Cross-sectional imaging presents a wide array of image manipulation possibilities. Being able to reconstruct multiple planes from a single CT or MR dataset provides the physician the ability to view anatomical structures from different aspects. Maximum Intensity Projection (MIP) views allow for better

evaluation of vascular structures.

Exhibit 3.1

237. Additionally, upon information and belief, the ResolutionMD viewer can render a user-defined thickness of the patent information data set as well as a curved reformat, which can be applied to other visualizations in the healthcare provider's workflow:

> Thick-slab MPR. The data set is rendered with a user-defined slab thickness for rapid and flexible reporting of large datasets. As part of the workflow all views automatically adjust to the newly applied thickness. Users see this rendering in real time, with server grade performance.
> …
> Curved MPR. Curved reformat is created easily and accurately for review of vessels or other anatomy.

Exhibit 3.1

238. Similarly:

> The ResolutionMD® software is a medical image viewer in your browser. The software features an easy-to-use search interface, collaboration, and advanced visualization. Visualization features include 2D viewing, Maximum Intensity Projection (MIP) including slabbing up to 50 mm, Multi Planar Reformatting (MPR) for axial, sagittal and coronal views, and 3D volume rendering. Each view mode enables you to view and interact with images, data, and reports (i.e. split view, linked scrolling, cine, pan and zoom, annotations and measurements.)

Exhibit 3.7

239. Upon information and belief, the ResolutionMD viewer is described as providing tools for manipulating the server-rendered image:

> Rotate 3D Volume. Real-time volume rendering allows physicians to rotate the image as desired to get the best perspective of the patient.
>
> Clipping Planes and Scalpel Tool. Reduce the data and volume being reviewed by using the clipping planes or scalpel tool, or isolate specific areas of interest from a larger dataset.
>
> Bone Removal. Single mouse-click manipulation enables the user to segment tissues from one another. An improved workflow enables faster, more efficient production of rendered images.

> Opacity Preset. Choose from a variety of preset values to quickly change the opacity, color, lighting parameters used during 3D volume rendering.
>
> Exhibit 3.1

240. For example, upon information and belief, the ResolutionMD viewer is described as providing 2D, MIP/MPR, and 3D views of remotely rendered patient imaging data, and avoids downloading full DICOM images to the client over bandwidth limited connections:

> The image viewer displays images and data from the study list in 2D, MIP/MPR and 3D view modes. It also contains tools for interacting with the data. This module describes how to use the image viewer to navigate and interact with images and data in the various view modes.
> …
> The ResolutionMD® software does not require full DICOM images to be downloaded to your mobile/desktop viewing device as studies/datasets are transferred between the PACS/VNA and the ResolutionMD® server within the hospital network. The delivery of rendered images from the server to devices over wireless networks will vary somewhat over different network types depending on bandwidth availability (i.e. raw speed of the network, either Wi-Fi or 3G cellular, and network latency, i.e. inherent delays on the network). In any case, we have observed that once communication is established to the server, typical data sets are fully loaded on the server and available for initial viewing on the mobile device in 8 to 15 seconds.
> …
> There are three different modes to view data: 2D, 3D, and MIP/MPR. The 2D view mode displays data in a two-dimensional format, the 3D view mode displays data in a three-dimensional format, and MIP/MPR view mode enables you to display data simultaneously in different orientations. Images are initially displayed in the 2D view mode, but you can switch view modes at any time in the image viewer.
>
> Exhibit 3.7

241. Similarly, upon information and belief, the ResolutionMD viewer is described as providing collaboration functionality for the remotely rendered visualizations:

> Image exchange
> Users can exchange images with outside hospitals or clinics, and studies can be sent to external facilities or used to request other patient exams. During a collaboration session, the user can also send or request studies to or from the collaborators.

Exhibit 3.3

242. Additionally, upon information and belief, the ResolutionMD viewer is described as a software built upon the PureWeb platform:

> • PureWeb is a software platform by Calgary Scientific upon which ResolutionMD is developed. PureWeb provides for the communication layer between the web server (Apache Tomcat) an the ResolutionMD services.
> • The Picture Archiving & Communication System (PACS) is the back-end data store in DICOM format.
> • The iOS/Android/Flex areas represents the various client viewer applications that can access ResolutionMD from within the hospital network or over the Internet.

Exhibit 3.5

243. Upon information and belief, the ResolutionMD system is typically installed within a data center or in close network proximity to the stored patient data, with easily manageable physical infrastructure and server equipment:

> ResolutionMD is typically intended to be installed within a data center in close network proximity to the back-end data store (and that's generally true for the LDAP security system as well). This is to minimize the network distance over which data transfer takes place between ResolutionMD and the data source...
> …
> Physical Infrastructure
> ResolutionMD is a server-based application which is accessible via a web browser running on a workstation, PC, laptop or notebook computer or via a native mobile iOS or Android application on a mobile device. Given that ResolutionMD is server based, paying close attention to physical infrastructure is among the simplest facets of security that can be implemented to protect ResolutionMD resources from unwanted access...
> …
> The hardware and operating system platform required for the most current version of ResolutionMD is based on the support for two primary components: select Nvidia Graphics Processing Units (GPU); and the operating system, Red Hat Enterprise Linux (RHEL) Enterprise Server (ES) or Windows Server. It is the operating system that in particular requires specific attention to ensure that it is secure. It is recommended that ResolutionMD and supporting applications be operated on a dedicated server platform. This greatly reduces performance and security risks from malware or viruses that may reside in other software applications.

Exhibit 3.5

244. Upon information and belief, the ResolutionMD viewer is described as providing secure imaging processes that preserves patient data on the server-side:

> Additionally, the web server component and imaging components are ideally located on the same server to reduce performance issues related to latency. From a security perspective, the imaging processes on the ResolutionMD server are short lived. They are only initiated for each imaging session and have an inactivity timeout configuration to control the active life of these processes. The processes provide no means of writing or changing data locally and only facilitate a save request to the back-end data source in the case of an image (screen) capture. The imaging components make no request to alter data, either locally or in the back-end data source...

Exhibit 3.5

245. Similarly, upon information and belief, the ResolutionMD viewer is described as providing user sessions with login security through a secure URL:

> Administrative functions of ResolutionMD are only accessible by those with the knowledge of the appropriate URL(s) to access those functions. Additionally, login credentials are required to permit further access to the administrative areas of the application. The ResolutionMD system includes the ability to configure timeout and user session control parameters so that opportunities for misuse of the system via intentional acts or user carelessness are minimized..

Exhibit 3.5

246. Similarly:

> Before you log in, check that you have the URL address of the application as well as your login credentials. If you do not have this information, contact your system administrator. To open a viewing session
> 1. Browse to the URL provided by your system administrator.
> 2. Enter your provided credentials in the appropriate fields.

Exhibit 3.7

247. Additionally, upon information and belief, the ResolutionMD viewer is described as providing security measures such as firewalls and DMZs to secure the servers from

unauthorized access and attacks:

> IT security best practices dictate that all network, servers and devices be deployed and configured in a manner which minimizes the opportunity for and the impact of external and internal attacks. Firewalls are typically a critical part of this security infrastructure. Depending on which user communities are accessing the ResolutionMD application and where they are located, the ResolutionMD server(s) can be deployed within the corporate network behind the firewall or within a DMZ, separated from both an internal network and the Internet.
>
> Exhibit 3.5

248. Similarly, upon information and belief, the ResolutionMD viewer is described as providing varying authentication schemes, privilege levels and roles for controlling access:

> ResolutionMD Server Application
> There are three privilege levels or roles defined for secure access into the ResolutionMD application. The Server Admin role enables access to all application configuration and administration capabilities on the system. The Server Monitor role enables access to a subset of application monitoring and log capabilities and finally a User role enables viewing of images. Each level is protected and requires a valid user ID / password for access.
> …
> The ResolutionMD application does not include a database of users, but instead relies on interfacing with external directories and databases for authentication. Standard LDAP and Secure LDAP authentication, as well as proprietary authentication mechanisms embedded into partner specific ResolutionMD plug-in modules, are supported.
>
> Exhibit 3.5

249. Additionally, upon information and belief, the ResolutionMD viewer is touted as providing secure data access with HIPAA compliant collaboration between multiple healthcare professionals over the same remotely rendered patient information:

> Secure data access. View patient data safely without moving or copying the data. Images and other patient data are maintained server-side, behind the firewall. Administrators control end user authentication and viewing access for studies.
>
> Collaborate in real-time, with multiple parties. Clinicians can connect to each other, their patients, and their data via interactive audio/video conferencing. These collaboration sessions are HIPAA compliant.
> …

> Secure access
> Access patient image data directly in multiple EHR/EMR systems, and from other archives Intelligently search multiple archives and use tiered archive searching Gain quick access to the records you need Sort search results and search for related studies Get 2D, MIP/MPR and 3D images quickly and reliably when you need them.
>
> Exhibit 3.11

250. Additionally, upon information and belief, the ResolutionMD viewer logs user activity by sessions associated with each user ID, recording activity and information accessed:

> Activity Logging
> Once a user has successfully authenticated into the ResolutionMD system, all user activity is logged. Within the log, all sessions are actively recorded by user ID and details on what information has been accessed.
>
> Exhibit 3.5

251. Upon information and belief, the ResolutionMD viewer keeps patient information in its secured storage and does not persist on either the ResolutionMD server or client device, and the ResolutionMD server queries in real time any user-specified images for the viewing session:

> Data is typically at the core of security concerns within system infrastructure and in the case of medical systems, Personal Health Information (PHI) data is of particular concern. However, no patient data is persistently stored either on the ResolutionMD server or on client devices which access the application. This greatly reduces potential PHI security concerns, eliminating the requirement to actively manage the security of data in these domains.
>
> Instead of caching requested studies on the server, ResolutionMD uses a real-time query mechanism to pull user-specified images into server memory only for the duration of the image-viewing session. This DICOM data is used by the server for the duration of the session to render 2D, 3D, and MIP/MPR images. Only rendered images (i.e., not DICOM data) are ever transferred to the client devices for viewing. Once a user ends their session or selects alternate images for viewing, the prior DICOM image data no longer persists on the server and rendered images no longer persist on the client.
>
> Exhibit 3.5

252. For example, upon information and belief, the ResolutionMD viewer utilizes a number of security measures to protect patient data at all points and in transit during transmission of server-rendered images:

> The ResolutionMD client application is dynamically loaded from the server at runtime within any Adobe Flash equipped browser through the use of a URL. For both Apple iOS mobile devices and Android mobile devices, the ResolutionMD client is a native application which is both lightweight and offers high-end user performance. Security has been part of the design of the ResolutionMD client since its inception:
> 1. No patient data is actually left persistent on the client mobile device or browser session. Once a session times out or is ended, the data in memory is deleted and no written data is persistent on the device. If a phone or tablet is lost or stolen there is no concern about patient data being left behind and accessible.
> 2. The ResolutionMD server is typically set up to require clients to enter login credentials for production use.
> 3. The image data delivered to an end user cannot be easily read in transit and can only be interpreted once rendered on the screen of the device. Even study textual meta-data that may be superimposed on the displayed image is delivered in bit format that does not allow for easy interpretation until rendered on screen.
> 4. The ResolutionMD client is typically further secured with the use of SSL. SSL implemented in conjunction with the ResolutionMD Server ensures that all data transmission between the client device and the server are encrypted so as not to be interpreted while in transit from a network.
> 5. Optionally, a VPN can be added as a secure conduit through which the end user device can communicate with the ResolutionMD server.
>
> Exhibit 3.5

253. For example, upon information and belief, the ResolutionMD viewer system is described as having the following components and query functions:

> ResolutionMD implements an Application Entity (AE) which acts either as a Storage Service Class User (SCU),a C-FIND / C-MOVE Service Class User (SCU) or a C-STORE Service Class Provider (SCP). This AE sends queries (C-FIND) initiated from ResolutionMD users to specific or all DICOM servers (Remote AE) identified within the ResolutionMD configuration. The query results are returned to ResolutionMD from the Remote and displayed to the requesting user.
>
> When a user requests images for retrieval (C-MOVE), ResolutionMD sends a move request to specified or all Remote AE. ResolutionMD then acts as the SCP to receive the requested images (C-STORE) into ResolutionMD server memory

and displays to the users 2D, 3D or MIP/ MPR representations of the images. No DICOM data is transferred to the end user device accessing the ResolutionMD server application and image data is never stored persistently on the user device or on the ResolutionMD server.

ResolutionMD also provides a Storage SCU capability when ResolutionMD manipulated images and reports are saved back to a PACS system.

Exhibit 3.6

254. Upon information and belief, the ResolutionMD data flow is depicted as follows:

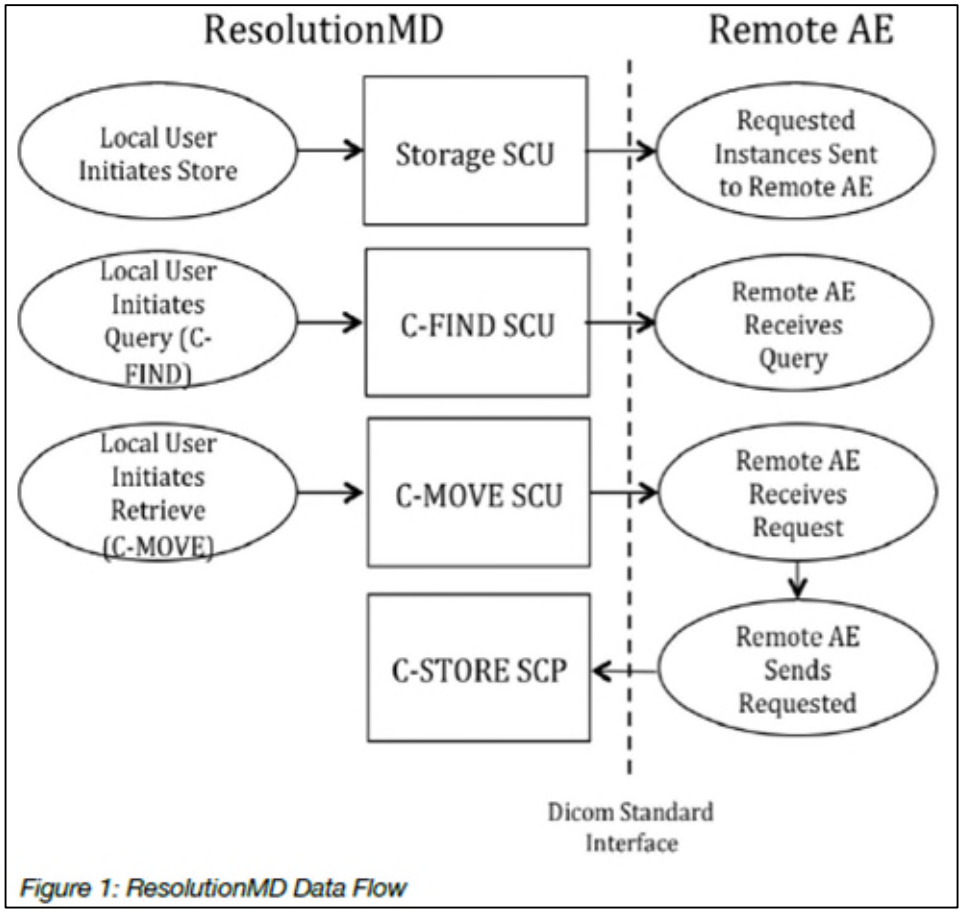


Figure 1: ResolutionMD Data Flow

Exhibit 3.6

255. For example, upon information and belief, the ResolutionMD viewer provides SSL connections from client to server:

ResolutionMD supports SSL connections directly between web or mobile clients and the ResolutionMD application on a centralized server. Organizations should ensure that these as well as other security precautions such as firewalls or virtual

> private networks are in place to ensure security and privacy of image information. ResolutionMD should be operated in an environment with strong focus and attention to security and it is the responsibility of the deploying organization to ensure their IT network is secure.
>
> Exhibit 3.6

256. For example, upon information and belief, the ResolutionMD viewer is described as providing adjustable quality settings the vary based upon available bandwidth and the amount of user manipulation or interaction with the remotely rendered images:

> Depending on the quality of your network connection, you can adjust the image quality to fine tune performance. Your adjustments are saved on your device and will be used in the future. The interactive quality slider adjusts the image quality during interaction with the volume and reduces the amount of network bandwidth used. The final quality slider adjusts the quality of the image after interaction..
>
> …
>
> NOTE: User-selected quality settings may result in information loss from the original imagery. Diagnostic interpretation should not be formed from the interactive images but only from the static, final-quality resulting image
>
> Exhibit 3.7

257. For example, upon information and belief, the ResolutionMD viewer is described as providing artificial intelligence and machine learning to assist with diagnosis using the remotely rendered patient images:

> Stay ready for advancements in machine learning. Artificial intelligence and machine learning are emerging catalysts for precision medicine. ResolutionMD facilitates the image sharing process that is core to machine-assisted analysis, optimizing time-to-diagnosis.
>
> Exhibit 3.11

258. For example, upon information and belief, the ResolutionMD viewer is described as providing a number of different viewing frameworks for remotely rendered images and manipulation tools associated with each option:

2D viewing
Image scrolling
Linked scrolling
Layouts
Reference lines, cine, image flip & rotate, freehand annotation, key image objects, grayscale/color softcopy presentation states (GSPS/CSPS), magnification lens, all images display
Image measurements and Cobb angle

MIP/MPR viewing
Oblique and double-oblique reformat Thick-slab MPR Triangulate Curved MPR
Image measurements

3D viewing
Rotate 3D volume Clipping planes and scalpel tool Lens tool Bone removal
Orientation preset hotkeys Interactive orientation widget Linear measurement
Opacity preset

Exhibit 3.11

259. For example, upon information and belief, the ResolutionMD viewer touts is low cost, based in part on the web based imaging solution using PureWeb as a platform for remotely rendered visualization of patient imaging data:

HIGH-TECH, LOW-COST
Web based medical imaging solutions based on PureWeb technologies, including the ResolutionMD advanced image viewer, save you money by shifting costs for advanced image rendering hardware and software from individual workstations to centralized server resources. These resources can be shared across a large number of users and scaled to most effectively meet image viewing requirements. Users not only save on the initial purchase costs of the hardware and software, but also significantly reduce the ongoing operational costs because of the shared and centrally located hardware systems.

PureWeb enables the ResolutionMD solution to enable access using a web browser. ResolutionMD does not require installation of client software, which means there are no incremental costs for managing client installs or OS upgrade and compatibility issues on the user systems. In addition, there is increased flexibility, since users will be able to access advanced imaging applications from any device with a properly configured web browser. In addition, the PureWeb and ResolutionMD solutions provide remote viewing of medical images on mobile devices, providing the added values and convenience of anytime/anywhere access, all via a common server based architecture and software application.

> All of this is achieved without a significant impact on applications performance and with increased security and privacy. Confidential patient image data are not downloaded to any user devices and do not leave the data center.
>
> Exhibit 3.14

260. For example, upon information and belief, the ResolutionMD viewer is described as providing centralized user authentication supporting Lightweight Directory Access Protocol and Active Directory authentication:

> Best Practice:
> For both ease of use and to ensure security, mobile applications should be integrated into a single sign-on using Lightweight Directory Access Protocol (LDAP) or an Active Directory (AD). By automating access to multiple systems, single sign-on make it easier to manage users and ensure they have the right permissions for health information access.
>
> ResolutionMD® enables centralized user authentication by fully supporting both LDAP and AD authentication. It also supports authentication across large-scale operations with multiple ADs, allowing users to share and view data between organizations without requiring new usernames or passwords.
> …
> Best Practice:
> Implement tools and applications that support straightforward and easy server installation across all desired applications and databases. Be sure that mobile applications fully support self-installation and updates through familiar application store downloads.
>
> ResolutionMD ® is a server-based application that queries any existing PACS or VNA using existing LDAP user information, eliminating any additional database or user management. All image rendering is done on the server eliminating any application conflicts with user devices or workstations.
>
> Exhibit 3.12

261. For example, upon information and belief, the ResolutionMD viewer is described as providing HTTPS and encrypted hyperlinks to avoid transferring or storing patient data on the remote client device:

> Best Practice:
> It is possible to use mobile technology to share and view information without transferring data permanently to a mobile device. Use applications that protect

> and encrypt data using HTTPS and do not transfer or store information on mobile devices.
>
> ResolutionMD® fully supports 128-bit encryption running over HTTPS as well as encrypted hyperlinks and never transfers or stores the patient data on mobile devices..
>
> Exhibit 3.12

262. For example, upon information and belief, the ResolutionMD viewer is described as providing user activity tracking logs for all actions and groups on image sets to which they have sufficient privileges to access:

> Best Practice:
> Provide access to patient data with applications that track and record what data was accessed, when and how it was accessed and by whom. Mobile applications should also have the ability to restrict access to a patient's images or other information.
>
> ResolutionMD® tracks and logs all actions of users and can be configured to allow groups to access specifically designated sets of images for which they have permissions.
>
> Exhibit 3.12

263. For example, upon information and belief, the ResolutionMD viewer is described as providing security measures such as SSL certificates to protect data over internal and external networks:

> Best Practice:
> Educate security administrators on the benefits of mobile information access and enterprise image-viewing and the ability to provide mobile access while maintaining institutional security protocols.
>
> ResolutionMD® provides integrated configuration tools and strong security technology that centralize control of user access to enterprise-wide images and protects data as it travels over internal and external networks.
> …
> Best Practice:
> Put security and encryptions in place first, including SSL certificates, so that the network and servers can support secure outside access.

> ResolutionMD® can be deployed locally in an organization's data center or centrally in the cloud. Cloud deployment allows a single organization or partnering organizations, that consist of geographically dispersed individuals or entities, to leverage cloud-based access.

Exhibit 3.12

264. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing web server connections to grant access to authenticated client devices:

> Server Connections
> In a PureWeb application, the service and the client are separate entities that communicate with each other over the Internet through the web server. Logically, therefore, the first steps of implementing the APIs revolve around setting up the connections between these components. This will allow you to interact with your service from your client as you progress through your application's development.

Exhibit 3.17.01

265. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing a connection workflow for authenticating and initiating a viewing session to client-server communications to transfer remotely rendered patient images to the client device:

> Connection Workflow
> There are two basic connection workflows for PureWeb applications, one for managed services and one for unmanaged services.
>
> In a managed service, the PureWeb server is responsible for starting and stopping the service when the client first connects. In this scenario, the connections follow this basic workflow:
> The client requests a session from the server.
> The server responds by launching the service.
> This is done automatically by the server. The server manages applications using its plug-in architecture.
> The service, on startup, connects to the server and establishes the session.
> The code for connecting the service creates and initializes in particular StateManagerServer, which handles all communications with the server.
> The client code is sent to the end user's browser.
> The client connects to the established session.

> The client uses an event listener to determine when the service has established the session.
>
> The basic application connection workflow for an unmanaged service is as follows:
> An external entity (the end user, or another process or application) launches the service, outside of the PureWeb server. In the code, the Start method must provide the IP address of the server as a parameter, as well as the port that the server uses to receive connections from the service. The service, on startup, connects to the server and establishes the session. The code for connecting the service creates and initializes StateManagerServer , which handles all communications with the server. The service is now recognized by the server as a queued unmanaged application. The client connects to the established session. The client uses an event listener to determine if the service has established the session.
>
> Exhibit 3.17.01

266. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing a secure URL for connecting from a client device to the server:

> The launch URL can follow one of two schemes. These are referred to as the "app" and the "view" URL schemes, named this way because of the last element in their respective path:
> http://localhost:8080/pureweb/app?...
> http://localhost:8080/pureweb/view?...
> The key difference is in the workflow:
> When you launch your client by providing an app URL in your browser, the PureWeb server starts the service application right away, and then it delivers the necessary client files (.html, .js, .css) to the browser. When the connect method is called in the client, the service application is already running, and the connection is completed.
>
> When you launch your client by providing a view URL, the PureWeb server delivers all the necessary client files to your browser (.html, .js, .css), but nothing more. The service application will not get started until the client converts the view URL to an app URL and calls the connect method with this new URL. This gives you the added flexibility of displaying the client in the browser without being connected to the service. Launching a client using an app URL is still supported for legacy reasons, but it is recommended to always launch your application using a view URL instead.
>
> Exhibit 3.17.01

267. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing URL parameters and schemes for connecting:

> URL Parameters
> Regardless of whether you use an app or a view URL, the supported parameters are the same:
> [protocol]://[host:port]/pureweb/[URL scheme]?name=[appname]&client=[client]&_diagnostics [true or false] &unmanaged=[true or false]
>
> where:
> URL Scheme is either app or view. appname is the name of the service application. This name must match the name that you provide in the application's plug-in file. Although it does not strictly have to match the name of the application that you provided when you initialized the StateManager object in your service, it's a good idea to be consistent across the board.
>
> client is a parameter which is mandatory for client applications that are not native apps of mobile devices. Accepted values are flex and html5. For native mobile apps (Android, iOS), simply omit the parameter. The _diagnostics parameter is optional. If specified with the value true , the client application will open with the Diagnostics Panel enabled. This panel is useful during client development, but you would typically not include it in a production application.
> The unmanaged=true parameter is mandatory if connecting to an unmanaged service. For managed services, you can simply omit this parameter altogether.
> URLs must be encoded and compliant with RFC-3986. Invalid characters could prevent the service from starting or cause other unexpected results.
> URL Format for Connecting the Client
> The client-side connect method expects an app URL; if you launched your client using a view URL (recommended), the SDK will automatically convert it to an app URL when it connects the client.
>
> Exhibit 3.17.01

268. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing algorithms for connecting to a server and starting a session:

> Connecting the Service
> Whether you intend to deploy the service as managed or unmanaged, the code for establishing the connection to the PureWeb server is essentially the same. It

involves initializing the StateManagerServer and StateManager classes and calling the Start method. Although the code for connecting the service is relatively short, it is responsible for implementing much of the behind-the-scene details that make PureWeb applications work smoothly and shelter developers from the burden of managing the complexities of image remoting and synchronized application state management. When connecting an unmanaged service, you must specify the IP address and port of the server; this is not necessary when connecting a managed service. The code below illustrates how to connect a service to the PureWeb server.

C++

```
int main(int argc, char *argv[])
{
CSI::CountedPrt<CSI::PureWeb::Server::StateManagerServer> server;
CSI::CountedPrt<CSI::PureWeb::Server::StateManager> StateManager;
// Ini CSI / PureWeb libraries CSI::Library::Initialize();
CSI::Threading:UiDispatcher::InitMessageThread(); //this thread is the UI thread
//Create PureWeb object instances
server = new CSI::PureWeb::Server::StateManagerServer();
StateManager = new CSI::PureWeb::Server::StateManager("Scribble");
if (argc > 1 && QString(argv[1]).contains("PureWeb", Qt::CaseInsensitive))
{
stateManager->PluginManager().RegisterPlugin("QtMessageTickler", new
QtMessageTickler());
server->Start(stateManager.get());
server->ShutdownRequested() += PureWebCommon::OnPureWebShutdown;
}
```

This code accomplishes the following:

Declares the StateManagerServer object in the main function (line 3). This implements an input and output thread to receive input and commands from the client, as well as to send responses to clients.

Declares the StateManager object in the main function (line 4). This class is responsible for much of the behind-the-scene code that makes PureWeb applications work smoothly: it is responsible for creating and updating application state , responding to input events and commands sent from the client, and generating responses such as updated images in views to send back to the client application.

Initializes the StateManager class with the service application's name (line 12).

Starts the server using the Start method (line 17).

To connect an unmanaged service, you would provide the IP address and port parameters on this line:

```
server.Start(StateManager, IPAddress.Parse(
[server_ip]
,
[port]
```

);

The default port that the PureWeb server uses to receive connections from the service is TCP port 8082. You can change this value, see Configuring the Ports.

Exhibit 3.17.01

269. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing algorithm:

Connecting the Client
To connect your client to the PureWeb server, you call the connect method on the WebClient class. When calling this method, you will need to provide the client's launch URL as discussed above.
The connect method expects an app URL; if you launched your client using a view URL (recommended), the SDK will automatically convert it to an app URL when it connects the client.
If your client's launch URL does not conform to either the app or view scheme, you will have to convert it first to the expected format (the app scheme)before you can pass it to the connect method.
HTML5
pureweb.connect(location.href);

Exhibit 3.17.01

270. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as combining remotely rendered images with keyboard mouse input, where all heavy computations for rendering the graphics are done on the server side.

In the PureWeb SDK, views provide remote client applications with a window into the visible elements of a service. They are a combination of images and keyboard/mouse input:

Images:
images displayed in views can be almost anything you want; they usually represent all or a portion of the service's interface. You can display as many views simultaneously on the screen as you need, and you can expose different views in different clients. For example, the illustration below shows a medical application with four separate views on the same screen, all independent of each other.

> …
> All the heavy computation for rendering the graphics is done by the service, which contributes to keeping the client very thin. The data used to generate the image remains securely in its source location, alleviating any security concerns. None of the images displayed as views persist on the client after the PureWeb
> session ends.
>
> In collaboration scenarios, when multiple clients are connected to a single service, the views on that service are available to all clients. Each client gets a copy of each view and can interact with each view independently.
>
> Exhibit 3.17.02

271. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality using the IRenderedView interface to generate views on the server side and display them in the client using a simple View object:

> On the service, views are generated using the IRenderedView interface. This interface works in conjunction with the paint functionality of the native development platform to generate the views.
>
> On the client, a simple View object is used to display the views which have been remoted by the service.
> The ViewManager interface provides methods for managing views. It contains, in particular, methods such as RenderViewImmediate and RenderViewDeferred for monitoring when a view's content has changed and a new render is required.
>
> Each view is assigned a unique name and registered with the StateManager class, a class that handles much of the behind-the-scene code that makes PureWeb applications work smoothly. When referring to a view, both the service and the client must use that view's unique name.
>
> Exhibit 3.17.02

272. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as capturing all client side mouse and keyboard inputs to map these events to manipulations of the remotely rendered images:

> Client-side views automatically capture all mouse and keyboard input, transmit those to the service, and replay them as method calls in the IRenderedView implementation, using the PostMouseEvent and PostKeyEvent handlers. It is then up to you to provide the content for these handlers in order to map them to input events within the service application. How you accomplish this depends on the framework that the service application uses. Touch-screen input can be handled by sending commands, or by mapping the input to PureWeb API mouse or keyboard events.
>
> Exhibit 3.17.02

273. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing an imaging pipeline to optimize performance and bandwidth usage for interacting with remotely rendered patient images:

> An important aspect of views is the imaging pipeline. When a user interacts with a view, the service transmits dozens of updated images to the client. The SDK handles the hard part of the imaging pipeline for you, so you don't have to worry about writing complex code for image encoding, quality, and transmission rate. However, you do have control and can use PureWeb API features to easily fine-tune the image type and quality of the graphics displayed in your views to optimize performance and bandwidth usage.
>
> In addition, the ViewManager interface also provides SetViewInteracting , for sending images of different quality when the user is interacting with the view; this is discussed in more detail in Setting the Image InteractivityMode.
>
> Exhibit 3.17.02

274. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality using the service-side IRendered View interface:

> The main interface for implementing views is the service-side IRenderedView interface (depending on the service programming language that you are working with, it may be called RenderedView). This interface makes calls to the native functionality of your service development platform to paint and set the dimensions of the view. It also contains functions that capture keyboard and mouse input from the end user, which makes it easier for you to map these events to the service-side functionality.

Exhibit 3.17.02

275. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as requiring each remotely rendered view to be given a unique name that both the service and client applications use to refer to and retrieve that specific view:

> Each view must be given a unique name; this is the name that both the service and client applications must use when referring to the view. This name must then be registered with the StateManager. Views will not attach properly if a unique name is not used.
> In order to communicate with the StateManager, views must inherit from the IRenderedView interface. If it is not possible or convenient for view classes to inherit directly from this interface, use an adapter pattern.
> Where a view is registered depends on whether or not the IRenderedView interface is implemented in a generalized view handling class.

Exhibit 3.17.02

276. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing remote rendering of patient images with compression and optimization processing:

> Since service applications are responsible for generating and processing the views, most of the effort involved in remoting a view comes down to implementing the service-side IRenderedView interface.
> Although the view is generated by the service, it is displayed on the client. For this reason, the service-side renderView function, which is actually responsible for rendering the image, makes a call to the native paint functionality of the client development platform that you are working with. In a similar fashion, the API's getActualSize and setClientSize functions simply make use of the client platform's native elements to set the dimensions of the panel in which the view will be displayed.
> Views must provide images to the RenderView method of IRenderedView. RenderView writes to the array provided by RenderTarget.RenderTargetImage().ImageBytes(). This passes the image into the PureWeb SDK's imaging pipeline for processing (compression and optimization) so that it can automatically be decoded in the client.

Exhibit 3.17.02

277. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as displaying service side views in a client application and changing the client side view based on events, including the use of a unique name for each view that must be registered in the state manager for the session:

> Displaying a service-side view in a client application is a simple operation: you use your client application's native functionality to create a container for the view, then use the View object, available in the client-side API, to add the view where it should be displayed.
> Remember that the client merely displays the image that has been remoted by the service. It does not generate or compute the image, and that image does not persist once the client disconnects.
> Note also that the view is attached only after the client has an active connection. Typically, a listener for the CONNECTED_CHANGED event will be included alongside the rest of the client initialization code. For a list of other events that your client can listen to, see Useful PureWeb Events.
> It is important, when writing the client-side code for displaying views, to use the view's unique name as registered in the state manager, otherwise, the view will not attach to the client.

Exhibit 3.17.02

278. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing a RenderViewImmediate and a RenderViewDeferred method, with the deferred method using less server-side resources without impacting the display of images on the client side:

> When it is time to render a new image, views call either the RenderViewImmediate and the RenderViewDeferred methods of the ViewManager interface.
> As their name indicates, the main difference in these methods is timing. In one case, the call to the service's RenderView interface is immediate, in the other instance, it is deferred.
> Using the deferred method is the most common, as it is less resource-intensive: the service does not need to spend time churning image bits that may not be

> needed by the client right away. The downside to this method is that you do not control when RenderView does get called, this is handled automatically by the PureWeb SDK. Deferring the call to RenderView is a service-side decision which does not impact the displaying of views in the client application. Image updates are seamless to the end users.

Exhibit 3.17.02

279. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality with the server handling the encoding, quality and rate of remotely rendered patient images:

> The PureWeb SDK automatically handles the nitty gritty details of the imaging pipeline, and therefore you do not need to write complex code to handle the encoding, quality and rate of the images that you are remoting in your views. You do, however, have control over quality and encoding format, and you can modify these settings relatively easily.
> Sending images in a more efficient format or lower quality means that the size of each view update will be smaller, which can be used to conserve bandwidth, reduce latency, and improve performance.

Exhibit 3.17.03

280. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing two modes for rendering quality and encoding, where a full quality mode is used when no interaction is occurring and a different mode is applied when there is interactivity:

> A key feature of the encoder configuration is the interactivity mode. When setting the client encoder configuration, you set two encoder formats: the interacting encoder format, and the non-interacting (or full-quality) encoder format. Then, in your service application, you have the option of toggling a boolean flag which indicates the current interactivity mode. The PureWeb APIs use the corresponding encoder format for the specified interactivity mode.
>
> Each view in each client can have its own image encoding configuration. For example, if you have an HTML5 client and an iOS client both with two views, the iOS client can use a different encoding configuration for each view, while the HTML5 client can use two completely different encoder configurations for its two views.

…

> Using the encoder configuration API is entirely optional. The default configuration is JPEGs at 70% quality for non-interactive mode, and JPEGs at 30%quality for interactive mode (if enabled). Interactive mode is not enabled by default.

Exhibit 3.17.03

281. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing support for multiple image encoding formats, including H.264 video and still images:

> The SDK currently supports the following encoding formats (mime-types): PNG, JPEG, Tiles and, to a certain extent in the Flex and HTML5 client SDKs,H.264. Each format has its pros and cons:
> PNG images, unlike JPEG and tiles, use loss-less encoding, and therefore changing the quality value for this mime type has no effect: the image will look the same, whether quality is set to 40 or 100.
> When using JPEG or PNG, the application updates the entire view. Tiles, on the other hand, are small header-less JPEG images which only update the parts of the view that have changed since the last update; this sends noticeably less data to the clients.
> Tiles require more computational effort on the part of the computer running the service application. Although this encoding format is supported in all client platforms except HTML5, tiles perform best when the client application is Flex; on other platforms, JPEGs perform best.
> H.264 is a popular video compression format which delivers high quality images at a fraction of the data size of other formats. Although H.264 can be a real boon to reduce bandwidth consumption, it is not suitable for every application. H.264 requires more time for both encoding and decoding than either JPEG or PNG, and this will reduce the frame rate of your application.
>
> H.264 is a video encoding format that provides a reduction in the bandwidth required to stream video data compared to the other encoding formats available in the SDK. The SDK comes with a built-in H.264 encoding implementation. It can also be used with x264, which is a more performant third-party implementation that can be obtained separately.

Exhibit 3.17.03

282. For example, upon information and belief, the software development kit

associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing a Boolean flag for indicating whether or not interactivity is occurring, with the quality and encoding modes adjusting according to the amount of interaction:

> You can set a boolean flag in your service application to indicate whether a user is currently interacting with a view. The PureWeb SDK then takes into account the current interactivity state for a given view when updating the image, and sends images encoded in encoding format specified by the client for the given interactivity state. When a user is interacting with a view, it is likely that the view is being updated very rapidly, to reflect the changes made by the user. Therefore, a popular approach is to send lower-quality images when the user is interacting with a view, and to restore full quality when interaction stops.
> To determine whether to use the settings for interactive or non-interactive modes, the application relies on the value for the SetViewInteracting parameter on the ViewManager. If this value is set to true, the application will use the interactive mode settings, if it is set to false, the application will use non-interactive (full quality) mode settings.
>
> Exhibit 3.17.03

283. For example, upon information and belief, the software development kit associated with ResolutionMD and its PureWeb platform describes the underlying functionality as providing unique strings associated with each remotely rendered image and updating the client to reflect the new state:

> The majority of the pixel streaming work is done using the IRenderedView interface.
> When PureWeb is ready to acquire a new image from this view. You must write to either RenderTarget::Bitmap or RenderTarget::ContentInfo.
>
> Views are identified by a string that must match a similar implementation on the client.
>
> The name is registered to a service instance of the view.
>
> Notify PureWeb that your image has changed and clients should be updated.
>
> Provide a div id, and the view name. PureWeb handles everything else.
>
> Choose an encoding(H.264 | JPEG |PNG | TILING), or use the defaults.

Exhibit 3.17.04

284. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutines in the AndroidHttpClient file, indicating authentication of an HTTP client session:

public final class AndroidHttpClient implements HttpClient
private AndroidHttpClient

285. Similarly, the following subroutines in the ConnectionActivity file also indicate password authentication:

public class ConnectionActivity extends Activity
public void loginToServer

286. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutines in the View, ResMDActivity, and ResMDClientView files, indicating a web-based delivery of images rendered from a remote server:

public View
public void showSubsetSliceSelector
public void updateImageDisplay

287. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutines in the ImageRenderer and View files, indicating image caching of remotely rendered images:

public class ImageRenderer extends ViewRendererBase
public Map<String, String> renderView
public final void setViewName

288. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutines in the BetterPopupWindow, ResMDActivity, ResMDClientView, and ResMDView files, indicating fetching of cached images:

public void setContentView
public void setContentView
public View findViewById
public void showSubsetSliceSelector
public void loadViews
public void setViewName

289. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutine in the View file, indicating clearing or flushing of internally cached images:

public void disconnectAndDestroyView()

290. Additionally, upon information and belief, the Calgary Scientific viewer includes at least code from the following subroutine in the ResMDAppStateShimManager file, indicating varying levels of resolution for remotely rendered images:

public List<AppStateShim> createShims

IV. COUNT I – INFRINGEMENT OF THE '167 PATENT

291. Plantiff repeats and realleges the allegations contained above as if fully set forth herein.

292. Defendants have directly infringed and continue to directly infringe, literally or under the doctrine of equivalents, one or more claims of the '167 Patent in violation of 35 U.S.C. §271(a) by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, Nuance PowerShare with the eUnity and ResolutionMD viewers.

293. For example, Defendants' thin client viewer provides at least the following functionality from claim 1 for viewing at a client device a series of three-dimensional virtual views over Internet of a volume visualization dataset contained on at least one centralized database:

a. providing at least one central data storage medium containing the volume visualization dataset;
b. providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
c. providing a client device linked to the at least one server and central storage medium over the Internet, the client device having local data storage medium for storing frames of views of the volume visualization dataset;
d. requesting at the client device a series of three-dimensional virtual views of at least a portion of the volume visualization dataset, the series of views comprising a plurality of separate view frames;
e. determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium;
f. sending from the client device to the server a request for any frame of the requested views not stored on the local data storage medium;
g. at the server, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium;
h. transmitting the created frames of the requested views from the server to the client device; and
i. displaying the requested series of three-dimensional virtual views of the volume visualization dataset at the client device by sequentially displaying frames transmitted from the server along with any frames of the requested series of views stored on the local data storage medium.

294. For example, Defendants' thin client viewer provides at least the following functionality from claim 6 for viewing at a client device a series of three-dimensional virtual views over Internet of a volume visualization dataset contained on at least one centralized database:

a. providing at least one central data storage medium containing the volume visualization dataset;
b. providing at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
c. providing a client device linked to the at least one server and central storage medium over the Internet, the client device having local data storage medium for storing frames of views of the volume visualization dataset;
d. requesting at the client device at least one three-dimensional virtual view of at least a portion of the volume visualization dataset;
e. determining if any frame of the requested at least one view of the volume visualization dataset is stored on the local data storage medium by:
f. creating a unique identifiable key of a request by the client device of a three-dimensional virtual view of the volume visualization dataset;

g. storing on the local data storage medium the unique identifiable key of a prior request by the client device of a three-dimensional virtual view;
h. comparing the unique identifiable key of a current request by the client device of a three-dimensional virtual view with a stored unique identifiable key of a prior request by the client device of a three-dimensional virtual view;
i. determining if values of the current and prior unique identifiable keys are equivalent;
j. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the three-dimensional virtual view; and
k. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the client device of a three-dimensional virtual view;
l. sending from the client device to the server a request for any frame of the requested at least one view not stored on the local data storage medium;
m. at the server, creating the requested frame of the requested at least one view from the volume visualization dataset in the central storage medium;
n. transmitting the created frame of the requested at least one view from the server to the client device; and
o. displaying the requested at least one three-dimensional virtual view of the volume visualization dataset at the client device by displaying either the frame transmitted from the server or any frame of the requested series of views stored on the local data storage medium.

295. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 7 in addition to claim 6:

associating the unique identifiable key of a prior request by the client device of a three-dimensional virtual view with a stored frame of the prior request of the three-dimensional virtual view.

296. For example, Defendants' thin client viewer provides at least the following functionality from claim 9 for viewing at a client device a series of three-dimensional virtual views of a volume visualization dataset contained on at least one centralized database:

a. providing at least one central data storage medium containing the volume visualization dataset;
b. providing a at least one server in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
c. providing a client device linked to the server and central storage medium over the Internet;
d. sending from the client device to the server a request for a plurality of three-dimensional virtual views of at least a portion of the volume

visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution;
e. at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the client device;
f. displaying at least a portion of the requested lower image quality parameter frames at the client device;
g. at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the client device; and
h. displaying the requested higher image quality parameter frames at the client device; and
i. wherein, after transmitting the lower image quality parameter frames to the client device, the server transmits the higher image quality parameter frames to the client device while the client device is displaying the lower image quality parameter frames.

297. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 12 in addition to claim 9:

the frames are transmitted from the server to the client device as a compressed video stream.

298. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 13 in addition to claim 9:

the frames are transmitted from the server to the client device as one or more single frames.

299. Defendants do not have a license or permission to use the claimed subject matter in the '167 Patent.

300. Plaintiff has been damaged and continues to be damaged by Defendants' infringement of the '167 Patent.

301. Plaintiff is entitled to recover from Defendants the damages sustained by Plaintiff as a result of Defendants' wrongful acts in an amount subject to proof at trial.

V. COUNT II – INFRINGEMENT OF THE '609 PATENT

302. Plaintiff repeats and realleges the allegations contained above as if fully set forth herein.

303. Defendants have directly infringed and continue to directly infringe, literally or under the doctrine of equivalents, one or more claims of the '609 Patent in violation of 35 U.S.C. §271(a) by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, Nuance PowerShare with the eUnity and ResolutionMD viewers.

304. For example, Defendants' thin client viewer provides at least the following elements from claim 1 for viewing at a client device at a remote location a series of three-dimensional virtual views over the Internet of a volume visualization dataset contained on at least one centralized database:

> a. at least one transmitter for accepting volume visualization dataset from remote location and transmitting it securely to the centralized database;
> b. at least one central data storage medium containing the volume visualization dataset;
> c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
> d. a resource manager device for load balancing the plurality of servers;
> e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;
> f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;
> g. a web application adapted to satisfy a user's request for the three-dimensional virtual views by:
>
> a) accepting at a remote location at least one user request for a series of virtual views of the volume visualization dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the volume visualization dataset,
>
> b) determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium,
>
> c) transmitting from the remote location to at least one of the servers a

request for any frame of the requested views not stored on the local data storage medium,
d) at at least one of the servers, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium,
e) transmitting the created frames of the requested views from at least one of the servers to the client device,
f) receiving the requested views from the at least one server, and displaying to the user at the remote location the requested series of three-dimensional virtual views of the volume visualization dataset by sequentially displaying frames transmitted from at least one of the servers along with any frames of the requested series of views stored on the local data storage medium.

305. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 4 in addition to claim 1:

the web application is adapted to select a secured site by using a domain name address on a web browser.

306. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 6 in addition to claim 1:

the web application is categorized as a medical device for diagnostic imaging viewing purpose.

307. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 7 in addition to claim 1:

the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to at least one of the servers.

308. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 8 in addition to claim 7:

an authenticated web application lists the volume visualization datasets that are viewable by the authorized user.

309. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 9 in addition to claim 8:

the web application initiates a virtual viewing by selecting a volume visualization dataset.

310. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 19 in addition to claim 1:

the web application determines storage of any frame of the requested views of the volume visualization dataset on the local data storage medium is by:

a. creating a unique identifiable key of a request by the remote location of a three-dimensional virtual view of the volume visualization dataset;
b. storing on the local data storage medium the unique identifiable key of a prior request by the remote location of a three-dimensional virtual view;
c. comparing the unique identifiable key of a current request by the remote location of a three-dimensional virtual view with a stored unique identifiable key of a prior request by the remote location of a three-dimensional virtual view;
d. determining if values of the current and prior unique identifiable keys are equivalent;
e. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the three-dimensional virtual view; and
f. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the remote location of a three-dimensional virtual view.

311. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 20 in addition to claim 19:

the web application associates the unique identifiable key of a prior request by the client device of a three-dimensional virtual view with a stored frame of the prior request of the three-dimensional virtual view.

312. For example, Defendants' thin client viewer provides at least the following elements from claim 22 for viewing at a client device at a remote location a series of three-dimensional virtual views over the Internet of a volume visualization dataset contained on at least one centralized database:

a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;
b. at least one central data storage medium containing the volume visualization dataset;
c. a plurality of servers in communication with the at least one centralized

database and capable of processing the volume visualization dataset to create virtual views based on client request;

d. a resource manager device for load balancing the plurality of servers;

e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;

f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;

g. a web application adapted to satisfy a user's request by:

a) accepting at the server a user request from the remote location for a plurality of three-dimensional virtual views of at least a portion of the volume visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution,

b) at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the remote location,

c) displaying at least a portion of the requested lower image quality parameter frames at the remote location,

d) at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the remote location,

e) displaying the requested higher image quality parameter frames at the remote location, and

f) after the lower image quality parameter frames is transmitted to the remote location, transmitting the higher image quality parameter frames from the server to the remote location while the remote location is displaying the lower image quality parameter frames.

313. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 25 in addition to claim 22:

the web application causes the server to transmit the frames to the remote location as a compressed video stream.

314. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 26 in addition to claim 22:

the web application causes the server to transmit the frames to the remote location as one or more single frames.

315. Defendants do not have a license or permission to use the claimed subject matter in the '609 Patent.

316. Plaintiff has been damaged and continues to be damaged by Defendants' infringement of the '609 Patent.

317. Plaintiff is entitled to recover from Defendants the damages sustained by Plaintiff as a result of Defendants' wrongful acts in an amount subject to proof at trial.

VI. COUNT III – INFRINGEMENT OF THE '667 PATENT

318. Plaintiff repeats and realleges the allegations contained above as if fully set forth herein.

319. Defendants have directly infringed and continue to directly infringe, literally or under the doctrine of equivalents, one or more claims of the '667 Patent in violation of 35 U.S.C. §271(a) by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, Nuance PowerShare with the eUnity and ResolutionMD viewers.

320. For example, Defendants' thin client viewer provides at least the following elements from claim 1 for viewing at a client device at a remote location a series of virtual views over the Internet of a volume visualization dataset contained on at least one centralized database:

> a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;
> b. at least one central data storage medium containing the volume visualization dataset;
> c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
> d. a resource manager device for load balancing the plurality of servers;
> e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;
> f. at least one physically secured site for housing the centralized database, the plurality of servers, at least a resource manager, and at least a security

device;

g. a web application adapted to satisfy a user's request for the virtual views by:

a) accepting at a remote location at least one user request for a series of virtual views of the volume visualization dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the volume visualization dataset,

b) determining if any frame of the requested views of the volume visualization dataset is stored on the local data storage medium,

c) transmitting from the remote location to at least one of the servers a request for any frame of the requested views not stored on the local data storage medium,

d) at at least one of the servers, creating the requested frames of the requested views from the volume visualization dataset in the central storage medium,

e) transmitting the created frames of the requested views from at least one of the servers to the client device,

f) receiving the requested views from the at least one server, and displaying to the user at the remote location the requested series of virtual views of the volume visualization dataset by sequentially displaying frames transmitted from at least one of the servers along with any frames of the requested series of views stored on the local data storage medium.

321. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 2 in addition to claim 1:

the web application is adapted to select a secured site by using a domain name address on a web browser.

322. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 3 in addition to claim 1:

the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to at least one of the servers.

323. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 8 in addition to claim 1:

the web application determines storage of any frame of the requested views of the volume visualization dataset on the local data storage medium is by:

a. creating a unique identifiable key of a request by the remote location of a virtual view of the volume visualization dataset;

b. storing on the local data storage medium the unique identifiable key of a prior request by the remote location of a virtual view;
c. comparing the unique identifiable key of a current request by the remote location of a virtual view with a stored unique identifiable key of a prior request by the remote location of a two-dimensional virtual view;
d. determining if values of the current and prior unique identifiable keys are equivalent;
e. if the values are equivalent, displaying from the local data storage medium a stored frame of the prior request of the virtual view; and
f. if the values are not equivalent, displaying a frame transmitted from the server of the current request by the remote location of a virtual view.

324. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 9 in addition to claim 8:

the web application associates the unique identifiable key of a prior request by the client device of a virtual view with a stored frame of the prior request of the virtual view.

325. For example, Defendants' thin client viewer provides at least the following elements from claim 11 for viewing at a client device at a remote location a series of virtual views over the Internet of a volume visualization dataset contained on at least one centralized database:

a. at least one transmitter for accepting the volume visualization dataset from the remote location and transmitting it securely to the centralized database;
b. at least one central data storage medium containing the volume visualization dataset;
c. a plurality of servers in communication with the at least one centralized database and capable of processing the volume visualization dataset to create virtual views based on client request;
d. a resource manager device for load balancing the plurality of servers;
e. a security device controlling the plurality of communications between a client device, and the server; including resource manager and central storage medium;
f. at least one physically secured site for housing the centralized database, plurality of servers, at least a resource manager, and at least a security device;
g. a web application adapted to satisfy a user's request by:
a) accepting at the server a user request from the remote location for a plurality of virtual views of at least a portion of the volume visualization dataset, the plurality of views comprising a plurality of separate view frames, the request including a request for a lower image quality

parameter for the frames, at a lower frame resolution, and a request for a higher image quality parameter for the frames, at a higher frame resolution,
b) at the server, creating the requested frames from the volume visualization dataset at the lower image quality parameter, and transmitting the lower image quality parameter frames to the remote location,
c) displaying at least a portion of the requested lower image quality parameter frames at the remote location,
d) at the server, creating the requested higher image quality parameter frames from the volume visualization dataset, and transmitting the higher image quality parameter frames to the remote location,
e) displaying the requested higher image quality parameter frames at the remote location, and
f) after the lower image quality parameter frames is transmitted to the remote location, transmitting the higher image quality parameter frames from the server to the remote location while the remote location is displaying the lower image quality parameter frames.

326. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 14 in addition to claim 11:

> the web application causes the server to transmit the frames to the remote location as a compressed video stream.

327. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 15 in addition to claim 11:

> the web application causes the server to transmit the frames to the remote location as one or more single frames.

328. Defendants do not have a license or permission to use the claimed subject matter in the '667 Patent.

329. Plaintiff has been damaged and continues to be damaged by Defendants' infringement of the '667 Patent.

330. Plaintiff is entitled to recover from Defendants the damages sustained by Plaintiff as a result of Defendants' wrongful acts in an amount subject to proof at trial.

VII. COUNT IV – INFRINGEMENT OF THE '397 PATENT

331. Plaintiff repeats and realleges the allegations contained above as if fully set forth herein.

332. Defendants have directly infringed and continue to directly infringe, literally or under the doctrine of equivalents, one or more claims of the '397 Patent in violation of 35 U.S.C. §271(a) by making, using, offering to sell, selling (directly or through intermediaries), and/or importing, in this District and elsewhere in the United States, Nuance PowerShare with the eUnity and ResolutionMD viewers.

333. For example, Defendants' thin client viewer provides at least the following elements from claim 1 for viewing at a client device at a remote location a series of virtual views over the Internet of a medical imaging dataset contained on a remote database:

> a. at least one remote data storage medium containing the medical imaging dataset;
> b. at least one server in communication with the remote database and capable of processing the medical imaging dataset to create virtual views based on a client request;
> c. at least one physically secured site for housing the at least one server, the secured site comprising an audited or tested premises; and
> d. a web application adapted to satisfy a user's request for the virtual views by:
>
> a) accepting at a remote location via an encrypted communication connection at least one user request for a series of virtual views of the medical imaging dataset, the series of views comprising a plurality of separate view frames, the remote location having a local data storage medium for storing frames of views of the medical imaging dataset,
> b) transmitting from the remote location to the at least one server via the encrypted communication connection a request for any frame of the requested views not stored on the local data storage medium,
> c) at the at least one server, creating the requested frames of the requested views from the medical imaging dataset in the remote storage medium,
> d) transmitting, via the encrypted communication connection, the created frames of the requested views from the at least one server to the client device,
> e) receiving, and storing, on the local data storage medium the requested views from the at least one server, and
> f) displaying to the user at the remote location the requested series of

> virtual views of the medical imaging dataset by sequentially displaying frames transmitted from the at least one server along with any frames of the requested series of views stored on the local data storage medium.

334. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 2 in addition to claim 1:

> the web application is adapted to select a secured site by using a domain name address on a web browser.

335. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 3 in addition to claim 1:

> the web application is adapted to be authenticated using an authorized user credentials prior to transmitting the request to the at least one server and lists the medical imaging datasets that are viewable by the authorized user.

336. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 11 in addition to claim 1:

> the web application causes the server to transmit the frames to the remote location as a compressed video stream or as one or more single frames.

337. Furthermore, Defendants' thin client viewer provides at least the following elements from claim 12 in addition to claim 1:

> genetic algorithms, self-organizing maps, neural networks or other machine learning algorithms are applied during processing of the medical imaging dataset.

338. For example, Defendants' thin client viewer provides at least the following functionality from claim 13 for viewing at a client device at a remote location a series of virtual views over the Internet of a medical imaging dataset contained on a remote database:

> a. providing at least one remote data storage medium containing the medical imaging dataset;
> b. providing at least one server in communication with the remote database and capable of processing the medical imaging dataset to create virtual views based on client request, a first or a secondary security device controlling the plurality of communications between a client device and the server;
> c. providing at least one physically secured site for housing the at least one

server, the secured site comprising an audited or tested premises;
d. providing a web application accessible at the client device linked to the at least one server and storage medium over the Internet via an encrypted communication connection, the client device having local data storage medium for storing frames of views of the medical imaging dataset, the web application adapted to perform the steps of:
e. requesting at the client device via the encrypted communication connection a series of virtual views of at least a portion of the medical imaging dataset, the series of views comprising a plurality of separate view frames;
f. determining if any frame of the requested views of the medical imaging dataset is stored on the local data storage medium;
g. sending from the client device to the server via the encrypted communication connection a request for any frame of the requested views;
h. at the server, creating the requested frames of the requested views from the medical imaging dataset;
i. transmitting the created frames of the requested views from the server to the client device via the encrypted communication connection; and
j. displaying the requested series of virtual views of the medical imaging dataset at the client device by sequentially displaying frames transmitted from the server along with any frames of the requested series of views stored on the local data storage medium.

339. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 14 in addition to claim 13:

the received frames of the requested views are stored on the client device local data storage medium.

340. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 16 in addition to claim 13:

the client device displays higher image quality parameter frames after completing display of lower image quality parameter frames.

341. Furthermore, Defendants' thin client viewer provides at least the following functionality from claim 17 in addition to claim 13:

the frames are transmitted from the server to the client device as a compressed video stream or as one or more single frames.

342. Furthermore, Defendants' thin client viewer provides at least the following

functionality from claim 18 in addition to claim 13:

> the step of applying genetic algorithms, self-organizing maps, neural networks or other machine learning algorithms during processing of the medical imaging dataset.

343. Defendants do not have a license or permission to use the claimed subject matter in the '397 Patent.

344. Plaintiff has been damaged and continues to be damaged by Defendants' infringement of the '397 Patent.

345. Plaintiff is entitled to recover from Defendants the damages sustained by Plaintiff as a result of Defendants' wrongful acts in an amount subject to proof at trial.

VIII. JURY TRIAL

Plaintiff demands a trial by jury of all issues so triable.

IX. PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter judgment against Defendants, granting the following relief:

A. A judgment holding Defendants liable for direct infringement of the Asserted Patents;

B. Damages resulting from Defendants' infringement of Asserted Patents in an amount to be proven at trial, but no less than a reasonable royalty, together with pre-judgment interest and post-judgment interest;

C. A judgment holding Defendants' infringement of the Asserted Patents to be willful and deliberate, and a trebling of damages pursuant to 35 U.S.C. § 284;

D. A judgment holding this to be an exceptional case, and an award for attorneys' fees, costs and expenses incurred prosecuting this action pursuant to 35 U.S.C. § 285; and

E. Such other and further relief as the Court deems just and equitable.

Date: January 11, 2022

COLE SCHOTZ P.C.

/s/ Andrew L. Cole

Andrew L. Cole (No. 5712)
500 Delaware Ave., Suite 1410
Wilmington, DE 19801
302.652.3131
acole@coleschotz.com

Attorneys for Plaintiff,
AI Visualize, Inc.

OF COUNSEL:

Sean N. Hsu (pro hac vice)
Rajkumar Vinnakota (pro hac vice)
Gary Sorden*
Vishal Patel (pro hac vice)
COLE SCHOTZ P.C.
901 Main St., Suite 4120
Dallas, TX 75202
469.557.9390
shsu@coleschotz.com
kvinnakota@coleschotz.com
gsorden@coleschotz.com
vpatel@coleschotz.com

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