

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CHARTER COMMUNICATIONS, INC.,
Petitioner,

v.

IARNACH TECHNOLOGIES LTD.,
Patent Owner.

IPR2024-01287
Patent 9,287,982 B2

Before GEORGIANNA W. BRADEN, CHRISTOPHER L. OGDEN, and
RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Related Matters

In this *inter partes* review, Charter Communications, Inc. (“Petitioner”) challenges the patentability of claims 1–3 and 5–11 of U.S. Patent No. 9,287,982 B2 (Ex. 1001, the “’982 patent”), which is assigned to Iarnach Technologies Ltd. (“Patent Owner”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a), addresses issues and arguments raised during the trial in this *inter partes* review. For the reasons discussed below, Petitioner has proven by a preponderance of the evidence that claim 5 is unpatentable, and has not proven by a preponderance of the evidence that claims 1–3 and 6–11 are unpatentable.

B. Procedural History

In the Petition, Petitioner challenged claims 1–11 of the ’982 patent. Paper 1 (“Pet.”) 1.

Following the Petition, Patent Owner filed a Preliminary Response, in which Patent Owner disclaimed claim 4. Paper 10 (“Prelim. Resp.”) 14 n.1; Ex. 2007. We instituted trial on all remaining challenged claims. Paper 12 (“Inst. Dec.”) 55. Following institution, Patent Owner filed a Response (Paper 20, “PO Resp.”), Petitioner filed a Reply (Paper 23, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 25, “PO Sur-reply”).

Petitioner submitted a Declaration from Paul Min, Ph.D., with its Petition (Ex. 1005 “Min Decl.”) and another Declaration from Dr. Min in opposition to the Patent Owner Response (Ex. 1016, “Supp. Min Decl.”). Patent Owner submitted a Declaration of Kerry Litvin, Ph.D (Ex. 2008, “Litvin Decl.”) with its Patent Owner Response. An oral hearing was held on

November 20, 2025, a transcript of which appears in the record. Paper 42, “Tr.”

C. Asserted Challenges to Patentability and Prior Art

Petitioner challenges claims 1–3 and 5–11¹ based on the grounds in the table below:

Ground	Claim(s) Challenged	35 U.S.C. § ²	Reference(s)
1	1, 2, 5–9, 11	103	Bernstein ³ alone or in combination with Tsuge ^{4, 5}
2	3, 10	103	Bernstein in combination with MEF 6.1 ⁶ and/or Tsuge

¹ As noted above, Patent Owner has disclaimed claim 4. Prelim. Resp. 14 n.1; Ex. 2007.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013.

³ U.S. Patent 8,831,425 B1, issued September 9, 2014 (Ex. 1006).

⁴ U.S. Patent 8,160,448 B2, issued April 17, 2012 (Ex. 1008).

⁵ A table on page 22 of the Petition indicates that MEF 6.1 also is part of Ground 1. The Board understands this representation to be erroneous, because the discussion of Ground 1 does not address MEF 6.1. Pet. 23–55. Furthermore, the description of Ground 1 as including MEF 6.1 is not grammatically correct in that it is missing a conjunction between MEF 6.1 and U.S. Patent No. 8,160,448. *Id.* at 22. Additionally, assuming the intended conjunction was “and/or,” which is used in Grounds 2 and 4, with that conjunction, the bases for Grounds 1 and 2 would be the same. Thus, there would be no need for separate grounds, which further indicates that Ground 1 was not intended to include MEF 6.1.

⁶ “MEF Technical Specification MEF 6.1, Ethernet Services Definitions – Phase 2,” The Metro Ethernet Forum (MEF), April 2008 (Ex. 1007). Petitioner also calls this document “ESD.” *See* Pet. 22.

Ground	Claim(s) Challenged	35 U.S.C. § ²	Reference(s)
3	1, 2, 5–9, 11	103	Tsuge alone or in combination with Bernstein
4	3, 10	103	Tsuge in combination with MEF 6.1 and/or Bernstein

Pet. 22; Ex. 2007.

D. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Pet. 2. Patent Owner identifies itself as the real party in interest. Paper 4, 2.

E. Related Matters

The parties identify the following district court litigation as involving the '982 patent:

Iarnach Technologies Ltd. v. Charter Communications, Inc., et al., 2:24-cv-00230 (E.D. Tex.) (“Related Litigation”).

Pet. 2–3; Paper 4, 2.

F. The '982 Patent

The '982 patent relates to “a passive optical network (PON), especially to a service auto-configuration method of an Ethernet passive optical network [(EPON)] system based on a data over cable service interface system (DOCSIS) back-office management system.” Ex. 1001, 1:7–12. The '982 patent is concerned with a passive optical network (PON) system based on a DOCSIS back-office management, and a DOCSIS Provisioning Of EPON (DPOE) network creating a network across the PON. *Id.* at 1:16–20.

A topology structure diagram of a DPOE network is illustrated in Figure 1 of the '982 patent, reproduced below. Ex. 1001, 1:1:18–21, 4:28–29. As shown in Figure 1, a DPOE network is composed of a back-office

management system including a Trivial File Transfer Protocol (TFTP) server, a DPOE system including equipment of a virtual coaxial cable modem (vCM), an optical line terminal (OLT) and other equipment, a DPOE optical network unit (ONU), and a customer premise equipment (CPE) terminal connected on the ONU. *Id.* at 1:18–26.

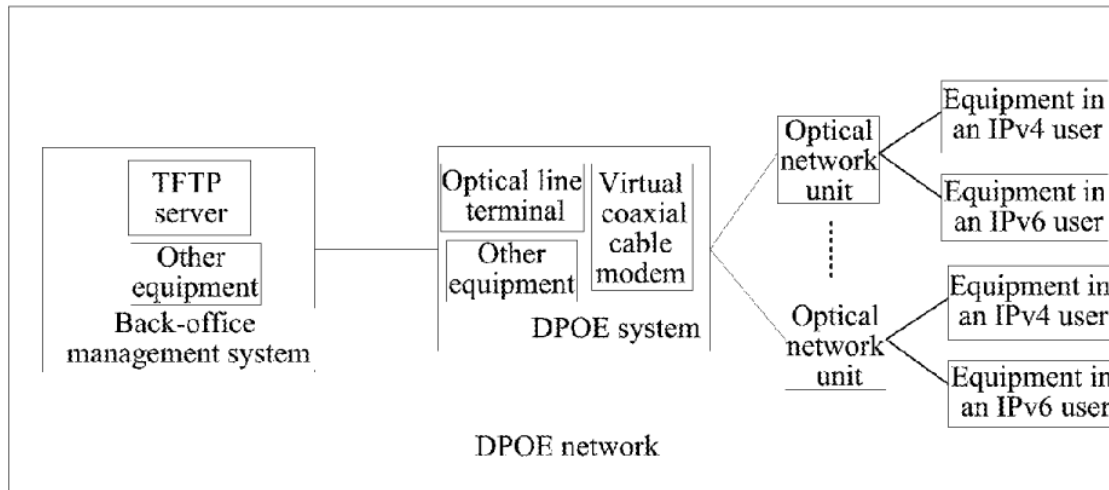


FIG. 1

Figure 1 illustrates a topology structure diagram of a DPOE. *Id.* at 1:18–21, 4:28–29.

To create a network across the PON, the ONU and OLT need to be configured, and the '982 patent explains that, conventionally, such processes included: the DPOE system performing an authentication on the ONU and completing a registration after authorization is passed; the vCM of the DPOE system initiating an initialization process specified according to a DOCSIS 3.0 specification, sending a TFTP request to the back-office management system, and downloading the configuration file from the TFTP server of the back-office management system; the configuration file being configured on the related ONU through a corresponding configuration management channel, thereby completing the data configuration for the

ONU. Ex. 1001, 1:26–56, 4:29–30. After completing the configuration of the ONU, in order to make the service on the ONU operate normally, a corresponding configuration on the OLT is needed. *Id.* at 1:57–64. The '982 patent explains that “the configuration on the OLT needs to be performed by hand individually, or performed through a command line, or performed through a simple network management protocol (SNMP) interface between an Element Management System (EMS) and the OLT.” *Id.* The '982 patent further explains that opening services corresponding to enterprise users generally need a large number of configurations to the OLT of the DPOE system in order to open the services, such that the relevant parameters of the OLT need to be configured at the same time for the ONU opening these services.” *Id.* at 1:65–2:2.

According to the '982 patent,

[t]he technical problem required to be solved by the present document is to provide a DOCSIS Provisioning Of EPON (DPOE) system and a service auto-configuration method and network based on that system, to make the service be opened without performing further configuration to the OLT individually after the process of the ONU initialization is completed, so as to improve the configuration efficiency of the whole system.

Ex. 1001, 2:50–58. In order to solve the above-mentioned technical problem, the '982 patent provides “a service auto-configuration method of an DOCSIS Provisioning Of EPON (DPOE) system,” the method including: the DPOE system acquiring a configuration file from a back-office management system, the configuration file comprising configuration information of an ONU and configuration information of an OLT in the DPOE system; the DPOE system analyzing the acquired configuration file, and obtaining the configuration

information of the ONU and the configuration information of the OLT; and the DPOE system configuring the OLT locally and configuring the ONU via a management channel between the OLT and the ONU, where the configuration information of the OLT may be configuration information related to services opened by the ONU. *Id.* at 2:59–3:10. Figure 3 of the '982 patent, reproduced below, illustrates a flow chart showing steps of an embodiment of a service auto-configuration method of a DPOE system. *Id.* at 4:31–33. 4:49–51.

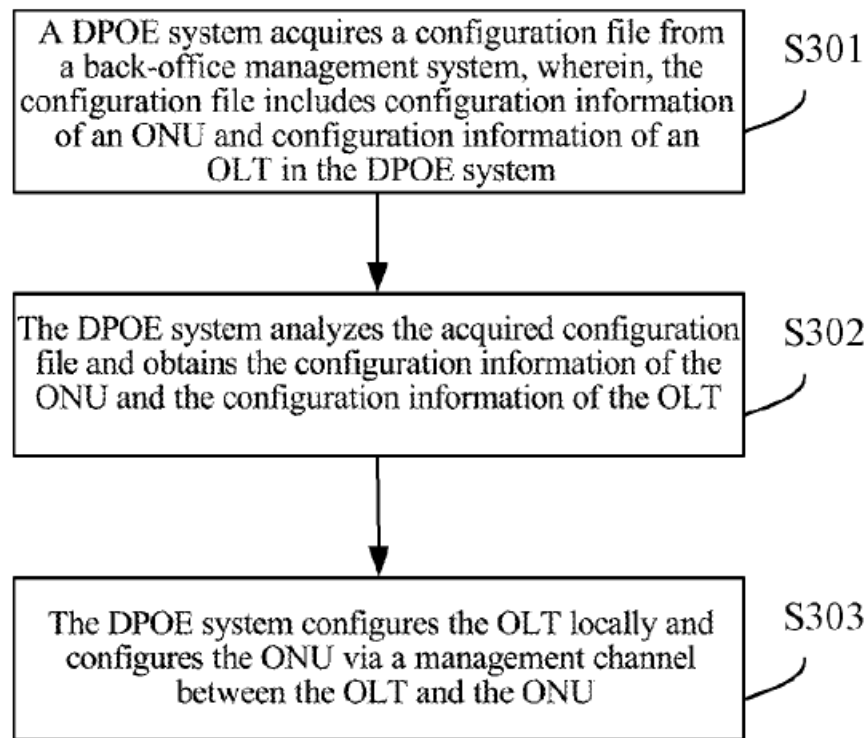


FIG. 3

Figure 3 illustrates a flow chart showing steps of an embodiment of a service auto-configuration method of a DPOE system. *Id.* at 4:31–33, 4:49–51.

The service auto-configuration method of the DPOE system illustrated in Figure 3 above includes the following steps. A step S301, in which the DPOE system acquires a configuration file from a back-office management

system, the configuration file including configuration information of an ONU and configuration information of an OLT in the DPOE system. Ex. 1001, 4:52–67. In the process of ONU initialization, a virtual coaxial cable modem (vCM) in the DPOE system initiates a TFTP request to the back-office management system, and the DPOE system acquires the configuration file from that back-office management system, the configuration file including the added configuration information about the OLT, the configuration information of the OLT being the configuration information related to services opened by the ONU. *Id.* In this way, the configuration file acquired by the DPOE system includes the configuration information for configuring the ONU and the OLT. *Id.* At step S302, the DPOE system analyzes the acquired configuration file and obtains the configuration information of the ONU and the configuration information of the OLT. *Id.* at 5:1–8. When analyzing the acquired configuration file, the DPOE system further converts the configuration information of the ONU into a message format which can be identified by the ONU, and converts the configuration information of the OLT into a message format which can be identified by the OLT. *Id.*

At step S303, the DPOE system configures the OLT locally and configures the ONU via a management channel between the OLT and the ONU. Ex. 1001, 5:9–20. After acquiring the configuration file, the DPOE system analyzes the configuration file and distinguishes the configuration information for configuring the ONU and the OLT, configures the OLT locally, transfers the information for configuring the ONU through the management channel between the DPOE system and the ONU, and configures the relevant parameters of the ONU. *Id.*

Figure 4 of the '982 patent, reproduced below, illustrates a flow chart of auto-configuration of an OLT and an ONU. Ex. 1001, 4:34–36.

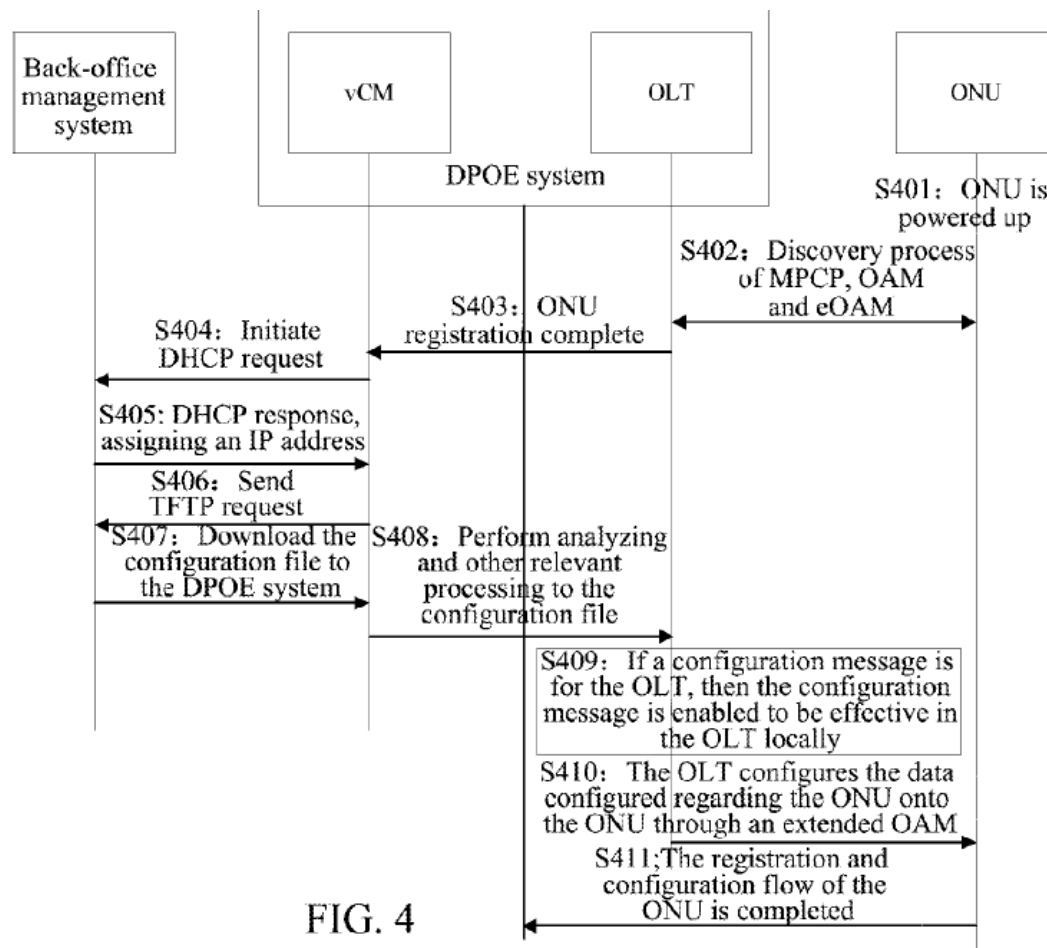


FIG. 4

Figure 4 illustrates a flow chart of auto-configuration of an OLT and an ONU. *Id.* at 4:34–36, 6:15–19.

As shown in Figure 4, in the process of the ONU powering up and registering, the process of configuration of the ONU and the OLT of the DPOE system is completed at the same time, through the following steps. Ex. 1001, 6:15–19. At step S401, the ONU is powered up, and the initialization process is started. *Id.* at 6:20–21. At step S402, the ONU and the DPOE system complete the initialization process of a PON layer, and at step S403, the DPOE system performs authentication on the ONU, and the authentication is passed. *Id.* at 6:22–25. Next, at step S404, the vCM

initiates a Dynamic Host Configuration Protocol (DHCP) request to a DHCP server of the back-office management system. *Id.* at 6:26–28. At step S405, the DHCP server of the back-office management system responds to the DHCP request, and assigns an IP address for the vCM. *Id.* at 6:29–31. At step S406, the vCM initiates a TFTP request to a TFTP server of the back-office management system, to request to acquire the configuration data file of the ONU corresponding to that vCM, and at step S407, the TFTP server of the back-office management system responds to the TFTP request initiated by the vCM, and downloads the configuration file of the ONU corresponding to that vCM into the DPOE system. *Id.* at 6:32–39.

At step S408, the above-mentioned configuration file (which includes a TLV required to be configured for the OLT of the DPOE system) is analyzed and processed, wherein, regarding auto-operation of the EVP-LAN service, and at step S409, the TLV based on the DOCSIS in the configuration file is converted into the message format which can be identified by the ONU and the OLT respectively. Ex. 1001, 6:40–48, 7:44–55. The DPOE system identifies which configuration message is for the OLT and which configuration message is for the ONU. *Id.* For example, the DPOE system can identify the configuration data of the OLT and the configuration data of the ONU automatically according to the content of the type field; and if it is configured for the OLT, then the configuration message is enabled to be effective in the OLT locally, but if the data is configured for the ONU, then step S410 is executed. *Id.* At step S410, the OLT configures the data configured for the ONU onto the ONU via the management channel between the OLT and the ONU, and at step S411, after completing the data

configuration to the ONU, the ONU notifies the DPOE system, and the registration process of the ONU ends. *Id.* at 7:56–64.

G. Challenged Claims

Petitioner challenges claims 1–3 and 5–11. Pet. 1; Ex. 2007.

Claims 1, 4, and 6 are independent and read as follows:

- 1.^[7] [1[preamble]] A service auto-configuration method of a DOCSIS Provisioning Of EPON (DPOE) system, comprising:
 - [1[a]] the DPOE system acquiring a configuration file from a back-office management system, wherein the configuration file comprises both configuration information of an optical network unit (ONU) and configuration information of an optical line terminal (OLT) in the DPOE system;
 - [1[b]] the DPOE system analyzing the acquired configuration file, and obtaining both the configuration information of the ONU and the configuration information of the OLT; and
 - [1[c]] the DPOE system configuring the OLT locally according to the configuration information of the OLT [1[d]] and meanwhile configuring the ONU according to the configuration information of the ONU via a management channel between the OLT and the ONU;
 - [1[e]] wherein, the method is performed in a process of ONU initialization; and
 - [1[f]] wherein, when analyzing the acquired configuration file, the DPOE system further converts the configuration information of the ONU into a message format which can be identified by the ONU, and [1[g]] converts the configuration information of

⁷ For ease of reference, we include the bracketed designations provided in the Petition for the limitations of claims 1, 4, and 6 (*see* Pet. ix–xii (Claim Listing)).

the OLT into a message format which can be identified by the OLT.

4. [4[preamble]] A data over cable service interface system (DOCSIS) Provisioning Of EPON (DPOE) system, comprising [4[a]] an acquisition unit, an analyzing unit and a configuration unit; wherein, during an process of an optical network unit (ONU) initialization,
 - [4[b]] the acquisition unit is configured to acquire a configuration file from a back-office management system, wherein the configuration file comprises configuration both information of the ONU and configuration information of an optical line terminal (OLT) in the DPOE system;
 - [4[c]] the analyzing unit is configured to analyze the acquired configuration file and obtain both the configuration information of the ONU and the configuration information of the OLT; and
 - [4[d]] the configuration unit is configured to configure the OLT locally according to the configuration information of the OLT and meanwhile configure the ONU according to the configuration information of the ONU via a management channel between the OLT and the ONU.
6. [6[preamble]] A service auto-configuration network of a DOCSIS Provisioning Of EPON (DPOE) system, comprising [6[a]] a DPOE system, a back-office management system and a plurality of optical network units (ONUs); [6[b]] wherein,
 - the DPOE system comprises an acquisition unit, an analyzing unit and a configuration unit; wherein, during an process of an optical network unit (ONU) initialization,
 - [6[c]] the acquisition unit is configured to acquire a configuration file from a back-office management

system, wherein the configuration file comprises configuration both information of the ONU and configuration information of an optical line terminal (OLT) in the DPOE system;

[6[d]] the analyzing unit is configured to analyze the acquired configuration file and obtain both the configuration information of the ONU and the configuration information of the OLT; and

[6[e]] the configuration unit is configured to configure the OLT locally according to the configuration information of the OLT and meanwhile configure the ONU according to the configuration information of the ONU via a management channel between the OLT and the ONU; and

[6[f]] the back-office management system is configured to: save the configuration file, and download the configuration file to the DPOE system, wherein the configuration file comprises the configuration information of the ONU and the configuration information of the OLT in the DPOE system.

Ex. 1001, 8:33–57, 9:3–22, 9:30–10:14.

II. PRELIMINARY ISSUES

A. Level of Ordinary Skill in the Art

Factors pertinent to determining the level of ordinary skill in the art include (1) the educational level of the inventor, (2) the type of problems encountered in the art, (3) prior-art solutions to those problems, (4) the rapidity with which innovations are made, (5) the sophistication of the technology, and (6) the educational level of workers active in the field. *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–97 (Fed. Cir. 1983). Not all factors may exist in every case, and one or more of these or other factors may predominate in a particular case. *Id.* These factors are not exhaustive, but merely guides to determining the level of ordinary skill in the

art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). Moreover, the prior art itself may reflect an appropriate skill level. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Petitioner asserts that an ordinarily skilled artisan at the time of the alleged invention “would have at least a bachelor’s degree in electrical engineering, computer science or comparable degree or 2–3 years industry experience designing and/or maintaining back-end networking equipment.” Pet. 11. In the Preliminary Response, Patent Owner stated that it “does not contest Petitioner’s recitation of the level of skill in the art, because even under Petitioner’s proposed level of skill,” Petitioner “has failed to demonstrate a reasonable likelihood of success.” Prelim. Resp. 17.

In the Institution Decision, we adopted Petitioner’s proposed definition of a person of ordinary skill in the art, finding that it was consistent with the ’982 patent and the asserted prior art. Inst. Dec. 14 (citing *Okajima*, 261 F.3d at 1355).

After the Institution Decision, Patent Owner states in its Patent Owner Response that it “disagrees with Petitioner’s recitation of the level of skill in the art,” but “even under Petitioner’s proposed level of skill,” Petitioner “has failed to establish that the prior art renders any claim obvious.” PO Resp. 10. Patent Owner does not provide its own definition of the level of ordinary skill in the art. *Id.*

For purposes of this Decision, we continue to adopt Petitioner’s proposed definition of a person of ordinary skill in the art, as we did in the Institution Decision, because we find that it is consistent with the ’982 patent and the asserted prior art.

B. Claim Construction

In the Petition, Petitioner submits that “[f]or purposes of this Petition only, Petitioner proposes no claim language requires express construction to resolve the grounds herein” but “reserves the right to propose additional/alternative claim constructions in this and other proceedings in response to arguments that may be advanced therein by PO.” Pet. 11. In the Preliminary Response, Patent Owner stated that no terms require construction, but also implied that the preambles of claims 1 and 6, including the phrase “a service auto-configuration method” in claim 1 and “a service auto-configuration network” in claim 6, are limiting. Prelim. Resp. 21–22, 30.

Following the Institution Decision, both parties submitted proposed claim constructions in the district court stating that the preamble is limiting. Ex. 2009, 3–4 (Petitioner’s Preliminary Claim Construction Chart); Ex. 2010, 7 (Patent Owner’s Preliminary Claim Construction Chart). Patent Owner states in the Patent Owner Response that “[t]he parties now agree that the entire preambles of both claims 1 and 6 are limiting.” PO Resp. 17. In its Reply, Petitioner states that “whether the Board finds the phrase ‘service auto-configuration’” in the preamble to be limiting is “immaterial” because it “does not affect the analysis of whether the prior art cited in the petition invalidates [the challenged] claims.” Pet. Reply 5. At the oral hearing, Petitioner acknowledged that it does not dispute that the entire preamble of claims 1 and 6 is limiting. Tr. 20:25–21:17, 23:15–17.

Because the parties agreed in district court that the entire preamble of claims 1 and 6 is limiting, and also agree in this proceeding, we find that the preambles of claims 1 and 6 are limiting for purposes of this Decision. We will discuss the meaning of the preamble further in the sections below

applying the prior art to the claims. *See* §§ III.A.4(a), III.A.7, III.C.1(a), III.C.7, *infra*.

Based on the record before us, and for purposes of this Decision, we do not need to, and do not, construe any other claim terms to resolve the controversy before us. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

III. ANALYSIS OF ASSERTED GROUNDS

A. Ground 1: Alleged Obviousness of Claims 1, 2, 5–9 and 11 Based on Bernstein and Tsuge

Petitioner argues that claims 1, 2, 5–9, and 11 would have been obvious over Bernstein alone or in combination with Tsuge. Pet. 22; Ex. 2007.

1. Overview of Bernstein

Bernstein is titled “Data Over Cable Service Interface Specification (DOCSIS) Over Passive Optical Network (PON),” and discloses a DOCSIS PON system (DPON) that makes optical subscribers appear as cable subscribers. Ex. 1006, codes (54), (57). A Cable Modem (CM) proxy is located in an Optical Line Termination (OLT), which implements a cable modem protocol stack that operates as the CM proxy and communicates with a back office system. *Id.* at code (57). The OLT translates the data retrieved by the CM proxy into Optical Network Unit (ONU) recognizable commands, and sends the translated data to the ONU. *Id.* In another embodiment, the CM proxy may be located in the ONU, which implements the cable modem protocol stack that operates as the CM proxy and communicates with the

back office system. *Id.* The ONU translates the data retrieved by the CM proxy into ONU recognizable commands and sends the translated data to the ONU. *Id.*

Figure 1 of Bernstein, reproduced below, illustrates a diagram of a DOCSIS PON (DPON) network architecture, and Figure 3 of Bernstein, reproduced below, illustrates details of a cable modem proxy used in the DPON system of Figure 1. Ex. 1006, 1:30–32, 1:35–36.

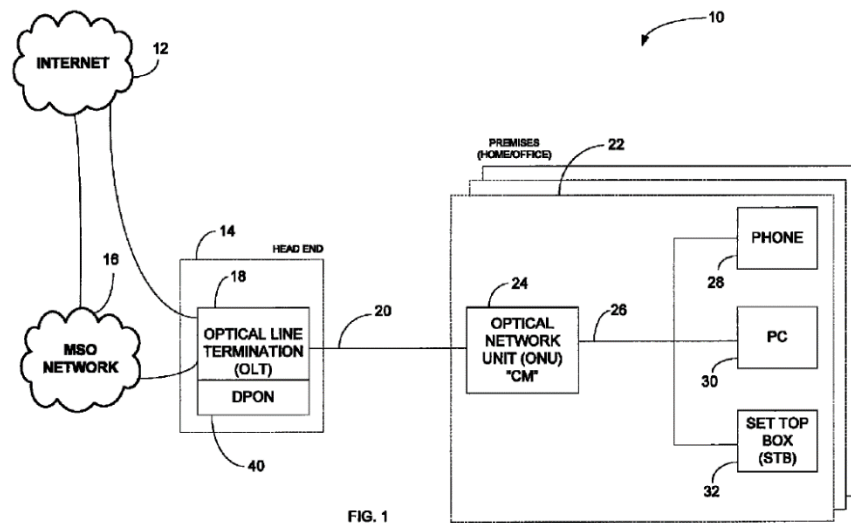


Figure 1 shows a Passive Optical Network (PON) 10 including a DPON system 40. *Id.* at 1:65–67, 2:54–56.

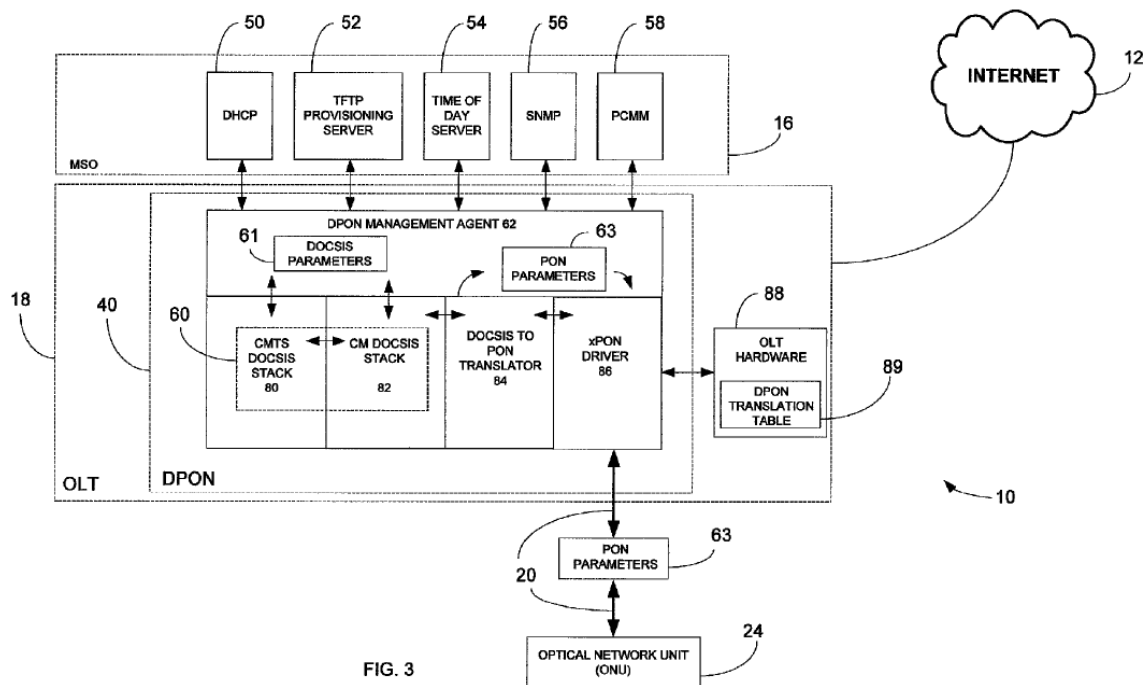


FIG. 3

Figure 3 shows DPON system 40 from Figure 1, in more detail.
Id. at 3:37–38.

Passive Optical Network (PON) 10 illustrated in Figure 1 of Bernstein includes an Optical Line Termination (OLT) unit 18 that communicates over an optical cable 20 with one or more Optical Network Units (ONUs) 24. Ex. 1006, 1:65–2:18. Bernstein mentions several different types of PON networks, such as Ethernet PON (EPON), Gigabit PON (GPON), and Wavelength-Divisional Multiplexing (WDM-PON). *Id.* PON 10 is a point-to-multipoint, fiber to the premises network architecture in which unpowered optical splitters are used to enable a single optical fiber 20 to serve multiple premises 22. *Id.* OLT 18 is located at a service provider central office head end 14, and receives Internet Packet (IP) data from a packet switched Wide Area IP network 12. *Id.* Packet data received by OLT 18 is converted into downstream optical signals and broadcast to each premises 22 sharing optical fiber 20. *Id.* ONUs 24 convert the optical signals carried over PON cable 20

back into digital packet data. *Id.* at 2:19–30. For example, ONUs 24 convert the optical signals into digital Ethernet packets that are sent over an Ethernet cable 26 to different Customer Premise Equipment (CPE), such as a phone 28, Personal Computer (PC) 30, and television Set-Top Box (STB) 32. *Id.*

An MSO network or “back office” 16 provides different network services, such as assigning IP addresses, providing Time of Day (ToD) information, and provisioning network resources. Ex. 1006, 2:30–39. Bernstein notes that while the services provided by MSO network 16 are readily available in cable networks, many of these services are not supported in PON networks. *Id.* Bernstein explains that “[t]here is a need to integrate PON subscribers 22 into the MSO backoffice network 16 as if they were cable modems,” however, “deploying a PON network 10 in an MSO network 16 is more than a protocol definition.” *Id.* at 2:40–44. To enable compatibility between MSO network 16 and PON network 10, OLT 18 is managed with a DOCSIS PON (DPON) system 40. *Id.* at 2:44–54.

DPON system 40 operates Cable Modem Termination System (CMTS) subscriber management software that acts as a gateway between a Cable Modem Termination System (CMTS) and PON 10. Ex. 1006, 2:44–60. DPON system 40 includes a translator that converts DOCSIS parameters obtained from MSO network 16 into PON parameters. *Id.* DPON system 40 operates with different PON standards that handle the layer one (physical layer) connection establishment to ONUS 24 while allowing the DOCSIS protocol to handle the second and third data link and network layers, respectively. *Id.*

Bernstein's Figure 3 (above) shows DPON system 40 in more detail. Ex. 1006, 3:37–46. As shown in Figure 3, Cable Modem Termination System (CMTS) stack 80 conducts some of the operations that would normally be performed by a CMTS in the head end of a DOCSIS cable network. *Id.* Cable Modem (CM) DOCSIS stack 82 conducts some of the operations that would normally be performed by a cable modem located at the customer premises of the DOCSIS cable network. *Id.* In this configuration, CMTS DOCSIS stack 80 and CM DOCSIS stack are located in OLT 18 of PON network 10. *Id.* CMTS stack 80 and CM stack 82 together operate as the cable modem proxy 60 that together communicate with MSO servers. *Id.* at 3:46–52. Operating both DOCSIS stacks 80 and 82 in OLT 18 effectively allow any of the services normally supported in a cable network to also be used in PON 10. *Id.* A DOCSIS-to-PON translator 84 is then used for converting parameters 61 obtained by cable modem proxy 60 into associated PON parameters 63 that can be used by OLT 18 and ONU 24. *Id.* at 3:52–63. Some of the translated PON parameters 63 are programmed into a PON driver 86 for either communicating with ONU 24 or sent over optical cable 20 for configuring ONU 24. *Id.* The translated PON parameters 63 may also be used for operating or configuring OLT hardware 88. *Id.*

Bernstein's Figure 7, reproduced below, is a message diagram showing how the cable modem proxy conducts cable modem sessions on behalf of an ONU. Ex. 1006, 1:40–42.

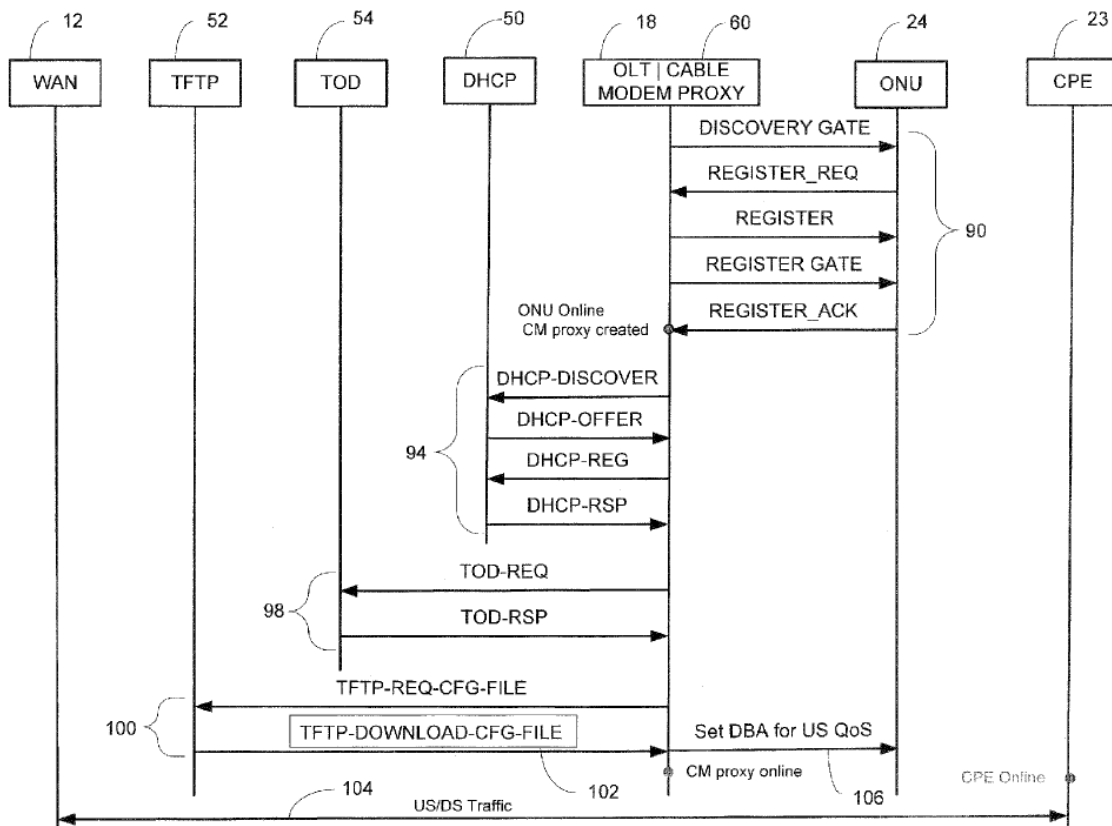


FIG. 7

Figure 7 is a message diagram showing how the cable modem proxy conducts cable modem sessions on behalf of an ONU. *Id.* at 1:40–42.

As shown in Figure 7, after physical layer establishment 90 and address registration 94, other services may be configured by CM proxy 60 on behalf of ONU 24. Ex. 1006, 5:22–25. For example, in a TFTP session 100, CM proxy 60 may send a TFTP request for a DOCSIS configuration file download. *Id.* at 5:31–40. TFTP server 52 replies with a TFTP download configuration file 102. *Id.* The information in TFTP file 102 is then translated and used for configuring schedulers/classifiers or other features on OLT 18 and ONU 24. *Id.* For example, information in TFTP configuration file 102 may be used to configure Dynamic Bandwidth Allocation (DBA) 106 for Upstream (US) Quality of Service (QoS) between OLT 18 and ONU 24. *Id.* After the registration process is completed, communication

links 104 are established between OLT 18 and ONU 24 that operate according to the DOCSIS parameters obtained by CM proxy 60 during sessions 94, 98, and 100. *Id.* at 5:40–48.

2. Overview of Tsuge

Tsuge is titled “Communication System Using Passive Optical Network and Passive Optical Network,” and discloses a communication system in which an OLT (Optical Line Terminal) transmits and receives a CMTS (Cable Modem Termination System)/CM (Cable Modem) apparatus control signal through an apparatus physical management interface which is physically identical to or different from a main signal interface, and processes the CMTS apparatus control signal by itself. Ex. 1008, codes (54), (57). When connection of a new ONU (Optical Network Unit, also called ONT (Optical Network Terminal) in Tsuge) is detected by an ONU apparatus control signal, an IP address is allocated by using the CM apparatus control signal in a manner similar to the CM. *Id.* at code (57). The CM apparatus control signal regarding the ONU is transmitted and received by using the IP address, and a mutual conversion is performed between the CM apparatus control signal and the ONU apparatus control signal. *Id.* The ONU processes the ONU apparatus control signal in a manner similar to the ONU based on an ordinary PON (passive optical network) standard. *Id.*

Figure 9 of Tsuge, reproduced below, illustrates a sequence diagram of the operation of a CM setting obtaining/converting function provided for the OLT. Ex. 1008, 6:4–6.

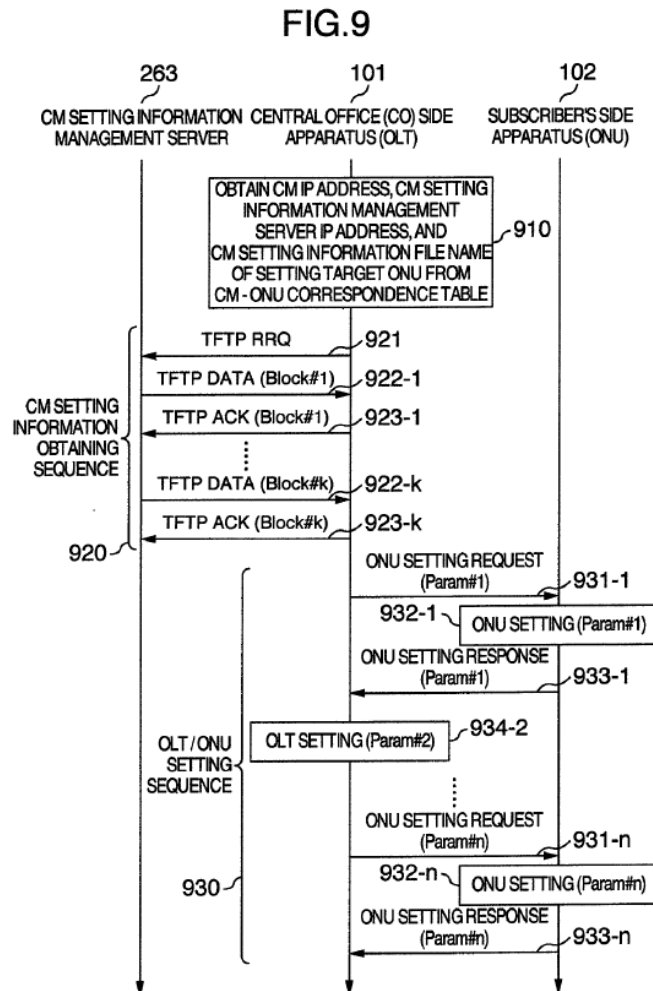


Figure 9 illustrates a sequence diagram of the operation of a CM setting obtaining/converting function provided for the OLT. *Id.* at 6:4–6.

Figure 9 shows an example of a CM setting process. Ex. 1008, 14:20–39. By using a CM-ONU correspondence table (551, described in more detail in Figure 11 of Tsuge, reproduced below), an OLT 101 obtains a CM IP address which has been made to correspond to the ONU as a target of a setting process, an IP address of a CM setting information management server (item 263), and a file name of CM setting information (step 910 in Figure 9). *Id.*

OLT 101 then executes the CM setting information obtaining sequence by using the information obtained by the procedure illustrated at step 920 in Figure 9. Ex. 1008, 14:40–61. A CM setting information file (discussed in more detail with respect to Figure 12 of Tsuge, reproduced below) is obtained from CM setting information management server 263 by using the IP address of CM setting information management server 263 and a CM setting information file name. *Id.* The CM IP address which has already been obtained is used as a PON side IP address at the time when the CM setting information obtaining sequence is executed. *Id.* The CM setting information obtaining sequence is executed by using a CM setting information signal. *Id.* According to the DOCSIS standard, the sequence is executed in a form of obtaining the file by the TFTP (Trivial File Transfer Protocol). *Id.* That is, the sequence is executed by repeating a procedure comprising steps 921, 922, and 923 in Figure 9, k times (where k denotes the total number of blocks in the case where the CM setting information file is divided into TFTP data blocks). *Id.*

Subsequently, at step 930, OLT 101 executes an OLT/ONU setting sequence by using the obtained CM setting information file. Ex. 1008, 14:62–15:22. More particularly, by using an algorithm shown in Figure 13 of Tsuge (reproduced below), OLT 101 sequentially interprets setting parameters included in the CM setting information file. *Id.* The contents of the setting parameters are converted into an ONU setting information signal or the settings to the OLT itself or into both of them. *Id.* In the case where they are converted into the settings to the OLT itself, the settings are reflected to the OLT (step 934). *Id.* In the case where they are converted into the ONU setting information signal, an ONU setting request message is

transmitted to ONU 102 as a setting target (step 931). *Id.* ONU 102, which received the ONU setting request message, reflects the requested setting to itself (step 932) and returns an ONU setting response message toward the OLT (step 933). *Id.* Each of the ONU setting request message and the ONU setting response message is one of the ONU setting information signal. *Id.*

Figure 11 of Tsuge, reproduced below, is a constructional diagram of a memory showing an example of a construction of a CM-ONU correspondence table provided for the OLT, and Figure 12 of Tsuge, reproduced below, is a frame constructional diagram showing an example of a construction of a CM setting information file which is obtained from a CM setting information management server. Ex. 1008, 6:10–16.

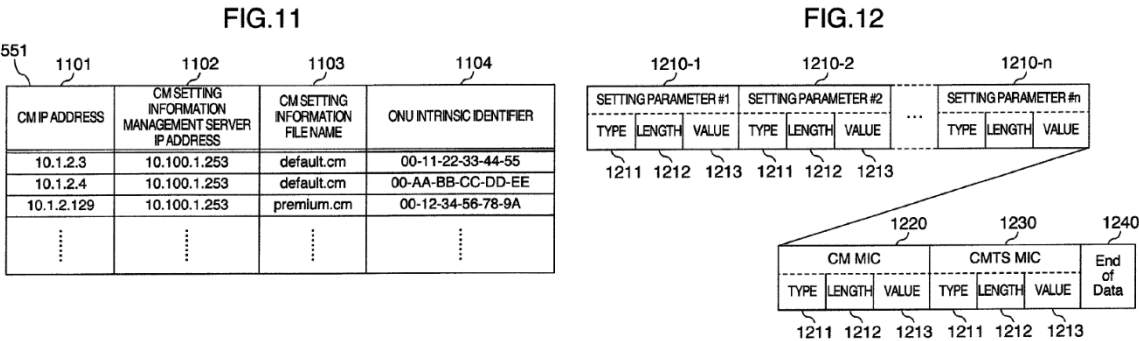


Figure 11 is a constructional diagram of a memory showing an example of a construction of a CM-ONU correspondence table (referenced with respect to step 910 in Figure 9) provided for the OLT, and Figure 12 is a frame constructional diagram showing an example of a construction of a CM setting information file (referenced with respect to step 920 in Figure 9) which is obtained from a CM setting information management server. *Id.* at 6:10–16.

As shown in Figure 11, a CM IP address 1101 obtained by a CM IP address obtaining process, and an ONU unique identifier 1104 corresponding to the CM IP address, are recorded in a CM-ONU correspondence table 551. Ex. 1008, 15:59–16:8. Although the MAC address of ONU 102 is used as an ONU unique identifier 1104 in Figure 11, other information may be used if

that information can identify the ONU. *Id.* Additional information, such as a CM setting information management server IP address 1102 and a CM setting information file name 1103, may be included in the CM-ONU correspondence table 551. *Id.*

As shown in Figure 12, a CM setting information file is constructed by zero or more setting parameters 1210, a CM MIC (Message Integrity Check) 1220, a CMTS MIC 1230, and an End of Data 1240. Ex. 1008, 16:9–33. Each parameter (including CM MIC and CMTS MIC) other than the End of Data 1240 has a TLV (Type-Length-Value) format constructed by a type 1211, a length 1212, and a value 1213. *Id.* A type value showing the meaning of each parameter 1210 is stored in the type 1211, and a specific type value allocated to each of CM MIC 1220 and CMTS MIC 1230 is stored in each of them. *Id.* The length 1212 indicates a byte length of the value 1213, and a setting value of each setting parameter 1210 is stored in value 1213. *Id.* A hash value calculated on the basis of all or part of the setting parameters is stored in value 1213 of CM MIC 1220 and CMTS MIC 1230. *Id.*

Figure 13 of Tsuge, reproduced below, is an operation flowchart of the operation of the CM setting obtaining/converting function provided for the OLT. Ex. 1008, 6:17–20.

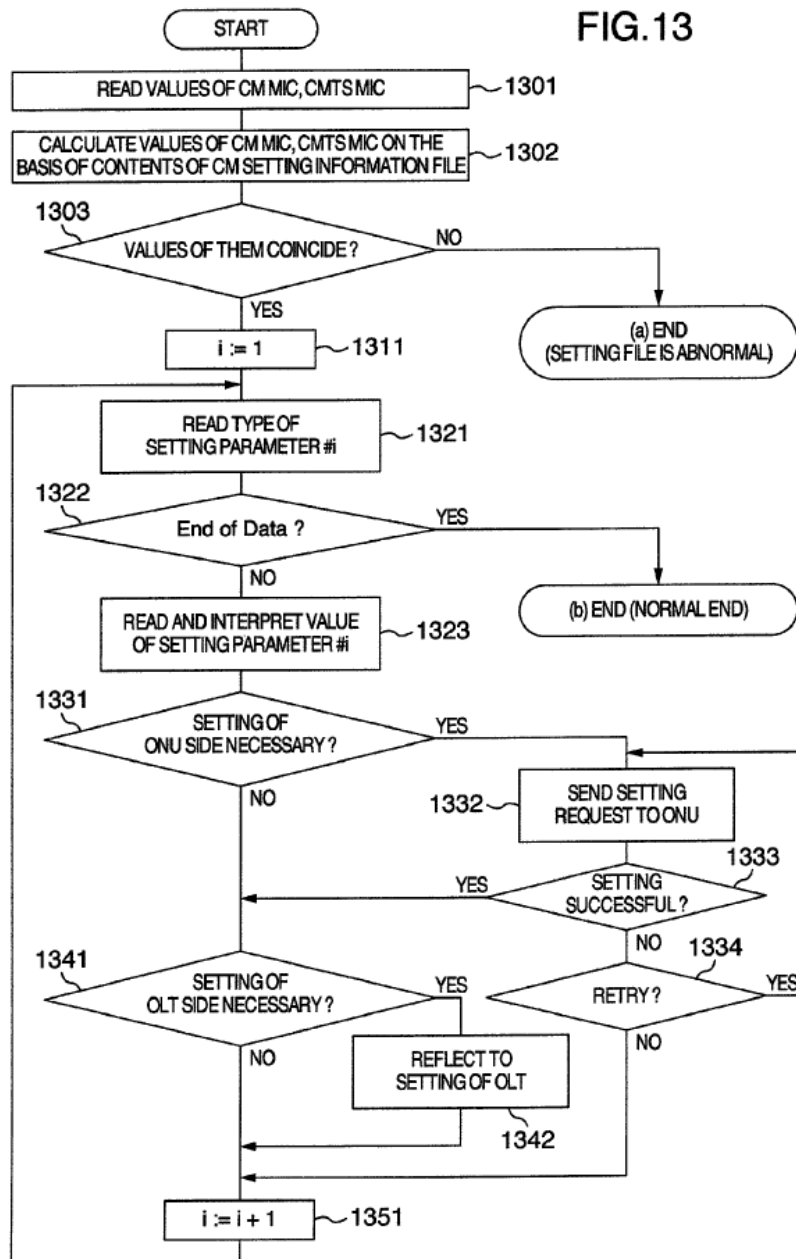


Figure 13 is an operation flowchart of the operation of the CM setting obtaining/converting function provided for the OLT. *Id.* at 6:17–20.

As shown in Figure 13, when the CM setting information file is obtained by the CM setting information obtaining sequence in Figure 9 of Tsuge (above), first (step 1301), the CM setting obtaining/converting function in OLT 101 searches for the parameters of the CM MIC and the CMTS MIC from the file and reads out their values. Ex. 1008, 16:39–52.

Subsequently, hash values of the CM MIC and CMTS MIC are calculated on the basis of all or part of the setting parameters in the CM setting information file (step 1302), and the MIC value in step 1301 and the MIC value in step 1302 are compared (step 1303). *Id.* If they do not coincide, it is determined that there is an abnormality in the CM setting information file, and the process regarding the CM setting information file is finished; but if they coincide, the processing routine advances to next step. *Id.*

At step 1311, a loop variable i is initialized to “1” in order to sequentially read the setting parameters, and the type of the i^{th} setting parameter from the top is read out (step 1321). Ex. 1008, 16:53–63. If the type value indicates the End of Data (step 1322), it is determined that the setting corresponding to the setting file has been completed, and the process regarding the CM setting information file is done. *Id.* If the type value indicates other than the End of Data, the value of the setting parameter is read out and the kind of settings necessary in the PON are interpreted together with the type value (step 1323). *Id.*

If the setting of the ONU is necessary (step 1331) as a result of the interpretation in step 1323, the corresponding ONU setting request message is transmitted to the ONU (step 1332). Ex. 1008, 16:64–17:11. Thus, if the setting has successfully been made (if an ONU setting response message showing the success in the setting has been received) (step 1333), step 1341 follows. *Id.* If the setting has failed (if an ONU setting response message showing the failure of the setting has been received), whether or not the setting should be retried is discriminated on the basis of the contents of the failure and the number of retry times so far (step 1334). *Id.* If the setting should be retried, the processing routine is returned to step 1332, and if the

setting should not be retried, step 1351 follows. *Id.* If the setting on the OLT side is necessary, the setting is reflected to the OLT (step 1342). *Id.* at 17:12–17.

3. Overview of MEF 6.1

MEF 6.1 is a Technical Specification including Ethernet Services Definitions, provided by the Metro Ethernet Forum (MEF). Ex. 1007, 1. MEF 6.1 defines three generic service constructs called Ethernet Service types, and specifies their associated service attributes and parameters used to create Point-to-Point, Multipoint-to-Multipoint, and Rooted-Multipoint Ethernet services. *Id.* at 6. MEF 6.1 also defines the requirements for several Ethernet services that use these generic Ethernet Service types. *Id.*

More particularly, MEF 6.1 defines an Ethernet Service type called E-Tree (Ethernet Tree), based on a Rooted-Multipoint Ethernet Virtual Connection (EVC). Ex. 1007, 11, 13. MEF 6.1 also updates service attributes and requirements for the existing defined Service Types of E-Line (Ethernet Line, based on a Point-to-Point EVC) and E-LAN (Ethernet LAN, based on a Multipoint-to-Multipoint EVC). *Id.* MEF 6.1 also defines more than one Ethernet Service for each of the three Ethernet Service types. *Id.* at 13, Table 2. For the E-Line Service Type, MEF 6.1 defines Ethernet Private Line (EPL) Private services (services using All to One Bundling UNIs (User Network Interfaces), port-based), and Ethernet Virtual Private Line (EVPL) Virtual Private services (services using UNIs that are that are Service Multiplexed (Virtual LAN (VLAN)-based)). *Id.* For the E-LAN Service Type, MEF 6.1 defines Ethernet Private LAN (EP-LAN) Private services (services using All to One Bundling UNIs, port-based), and Ethernet Virtual Private LAN (EVP-LAN) Virtual Private services (services using

UNIs that are that are Service Multiplexed (VLAN-based)). *Id.* For the E-Tree Service Type, MEF 6.1 defines Ethernet Private Tree (EP-Tree) Private services (services using All to One Bundling UNIs, port-based), and Ethernet Virtual Private Tree (EVP-Tree) Virtual Private services (services using UNIs that are that are Service Multiplexed (VLAN-based)). *Id.*

4. Independent Claim 1

Petitioner argues that claim 1 would have been obvious over Bernstein alone or in combination with Tsuge. Pet. 22. Petitioner provides an analysis of claim 1, supported by expert testimony. *Id.* at 24–46. Patent Owner raises two issues regarding Petitioner’s analysis. First, Patent Owner asserts that Petitioner has not shown how the asserted art teaches or suggests “[a] service auto-configuration method,” recited in the preamble of claim 1. PO Resp. 20–24. Second, Patent Owner argues that Petitioner has not shown that the asserted art teaches or suggests “analyzing the acquired configuration file,” recited in limitation 1[b]. *Id.* at 24–28. We address these disputed issues below.

a. 1[preamble] a service auto-configuration method

Petitioner asserts that, to the extent that the preamble of claim 1 is limiting, Bernstein teaches that preamble. Pet. 24. Petitioner argues that Bernstein discloses “A Data Over Cable Service Interface Specifications (DOCSIS) Passive Optical Network (PON) system.” *Id.* (quoting Ex. 1005 ¶ 59). Petitioner further argues that Bernstein explains that his system is implemented on an “Ethernet PON (EPON).” *Id.* Additionally, Petitioner contends that Bernstein’s Figure 3 depicts a DPoE system comprising OLT 18 including DPON 40 and Cable Modem Proxy 60 (a virtual cable modem.) *Id.* In the section discussing the preamble, Petitioner does not

explain how the prior art discloses “a service auto-configuration method.”

Id. Petitioner also does not propose a construction for the term “a service auto-configuration method.” *Id.* at 11, 24.

In the Institution Decision, we explained that “Petitioner does not appear to have addressed how Bernstein teaches or suggests ‘[a] service auto-configuration method’” in the preamble of claim 1. Inst. Dec. 32 (citing Pet. 24).

Following the Institution Decision, Patent Owner agreed with our preliminary determination that Petitioner failed to address how Bernstein teaches or suggests “[a] service auto-configuration method,” and argued that this failure “is fatal to the Petition.” PO Resp. 20 (citing Inst. Dec. 32). According to Patent Owner, “Petitioner and its expert point solely to Bernstein’s discussion of a DOCSIS Passive Optical Network (PON) system and separate references to an ‘Ethernet PON (EPON),’” but “the Petition is silent about a ‘service auto-configuration’ method or network” and “none of the cited sections of Bernstein discuss ‘service auto-configuration.’” *Id.* at 23 (citing Pet. 24; Inst. Dec. 32; Ex. 2008 ¶¶ 40–42; Ex. 1006, code (57), 2:2–5, 2:44–3:46). “By failing to address this element in the Petition,” according to Patent Owner, “Petitioner has failed to carry its burden to show that [claim 1 is] obvious.” *Id.* at 20.

In its Reply, Petitioner does not provide a construction for a “service auto-configuration method” but instead points to what it contends is ***Patent Owner’s*** interpretation of this term. Specifically, Petitioner asserts as follows:

PO asserts that the following patent language exemplifies what is meant by *service auto-configuration*: “the present document adds the configuration information about the OLT of

the DPOE system in the configuration file, and completes the automatic configuration on the OLT and the ONU at the same time; [during] the process of the ONU initialization[.]”

PO’s arguments specify that service auto-configuration has three characteristics: (1) configuration by the DPOE system of both the ONU and OLT at the same time; (2) using a configuration file that includes configuration information of both the ONU and OLT; and, (3) configuration of the ONU and OLT occurs during ONU initialization.

Pet. Reply 3 (citing PO Resp. 18–19; Ex. 1016 ¶¶ 6–9) (emphasis added); *see id.* at 5 (citing Ex. 1016 ¶¶ 10–14). Petitioner also asserts that Dr. Litvin testified that service auto-configuration “is synonymous with the following: ‘configuration of the OLT and the ONU at the same time through a configuration file including the configuration information of the ONU and the configuration information of the OLT in the DPOE system; [during] the process of the ONU initialization.’” *Id.* at 3 n.1 (citing Ex. 2008 ¶ 42).

Additionally, Petitioner argues that the three-part definition of a “service auto-configuration method” is consistent with the flow chart of Figure 3 of the ’982 patent, reproduced below.

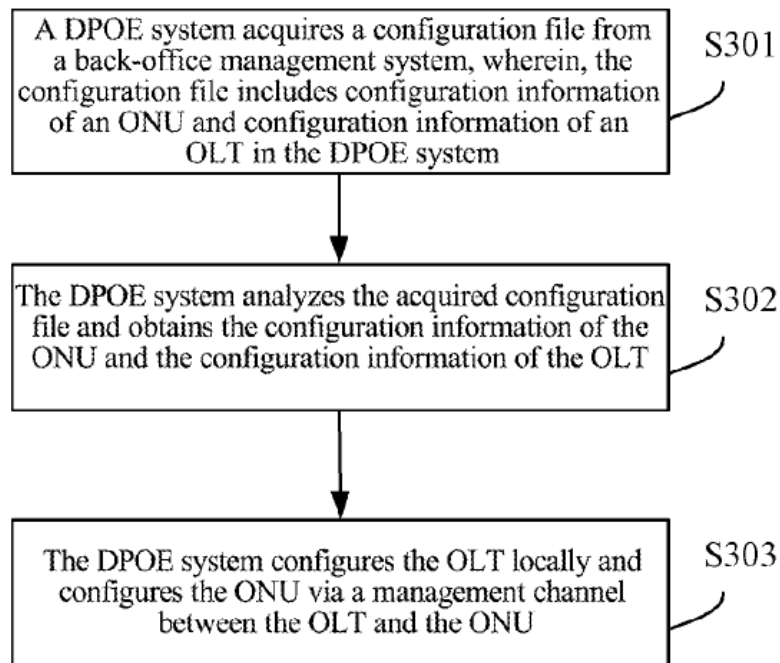


FIG. 3

Figure 3 of the '982 patent depicting steps S301–S303 of an embodiment of the invention. Ex. 1001, Fig. 3.

Pet. Reply 4; Ex. 1001, Fig. 3. Petitioner argues that “[e]ach of these automated steps is already reflected in the bod[y]” of claim 1 and thus, “any definition of the term ‘service auto-configuration’ at best merely duplicates limitations already recited in the bod[y] of [claim 1].” Pet. Reply 4–5 (citing Ex. 1016 ¶¶ 10–14); *see id.* at 5 (citing Ex. 1016 ¶¶ 10–14). Petitioner also argues that Dr. Litvin “agreed that the steps recited in [c]laim 1 ‘comprise a service auto-configuration method.’” *Id.* at 4 (citing Ex. 1017, 32:16–33:13).

Petitioner asserts that “[t]he Petition makes particular arguments showing how Bernstein teaches a ‘service auto-configuration’ method in which a DPOE system automatically configures an ONU and OLT at the same time during a process of initializing an ONU using a configuration file

that includes both ONU and OLT configuration information.” Pet. Reply 5–6 (citing Pet. §§ VIII(A)(1))b–g), VIII(A)(5)(b–g)); *see id.* at 4 (citing Pet. §§ VIII(A)(1), VIII(A)(5), VIII(C)(1), and VIII(C)(5)). Petitioner also argues that the Patent Owner Response “does not contest that Bernstein teaches these steps, or that a *service auto-configuration* method [] requires anything further.” *Id.* at 6. Petitioner does not further explain how the prior art teaches a “service auto-configuration method.” *Id.* at 2–5.

In its Sur-reply, Patent Owner asserts that it never provided the definition of “service auto-configuration” that Petitioner ascribes to Patent Owner. PO Sur-reply 5–6. Patent Owner argues that it never defined “service auto-configuration” to have the three characteristics Petitioner ascribes to Patent Owner, and asserts that Petitioner “only cites to its own expert’s new declaration for this position and cannot point to anything in the [Patent Owner] Response.” *Id.* (citing Pet. Reply 22). Patent Owner also contends that none of the three characteristics Petitioner points to “include auto-configuration or service configuration, the actual terms used in the claim.” *Id.* at 7. Instead, according to Patent Owner, Petitioner’s three characteristics “attempt[] to improperly read this element out of the claim by arguing that it is ‘already reflected in the bod[y]’” of claim 1. *Id.* Patent Owner further contends that Petitioner’s Reply “does not even cite the relevant sections of the Petition” that it is relying on to meet the “service auto-configuration” limitation in the preamble. *Id.*

Based on the full trial record, we find that Petitioner has failed to meet its burden to show that Bernstein recites a “service auto-configuration” method as recited in the preamble of claim 1. As discussed above, the parties agree that the preamble of claim 1, including the “service auto-configuration

method” language, is limiting. *See* § II.B, *supra*. As we explained in the Institution Decision, the Petition does not set forth a construction of “service auto-configuration method” or explain how the prior art discloses a “service auto-configuration method.” Pet. 11, 24; Inst. Dec. 32. Instead, the Petition merely explains how Bernstein teaches “a DOCSIS Provisioning of EPON (DPoE) system,” without explaining how it teaches a “service auto-configuration method.” Pet. 24 (citing Ex. 1005 ¶ 59). By failing to offer a construction of “service auto-configuration method” or explain how this limitation is met by the prior art, the Petition fails to show by a preponderance of the evidence that the prior art discloses or suggests this limitation.

We do not agree with Petitioner’s statement in the Reply that “[t]he Petition makes particular arguments showing how Bernstein teaches a ‘service auto-configuration’ method in which a DPOE system automatically configures an ONU and OLT at the same time during a process of initializing an ONU using a configuration file that includes both ONU and OLT configuration information.” Pet. Reply 5–6 (citing Pet. §§ VIII(A)(1)(b–g), VII(A)(5)(b–g); *see id.* at 4. Petitioner does not explain or point out with sufficient specificity where and how the Petition makes these “particular arguments,” other than merely citing to sections of the Petition addressing other elements in the body of the claim. *Id.* To the contrary, as discussed previously, the Petition does not explain the meaning of a “service auto-configuration method” or how this meaning would be met by Bernstein. Pet. 24. As the Federal Circuit has held, “[i]t is of the utmost importance that petitioners . . . adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to

each claim.”” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). The Petition does not do so here.

We also find that Petitioner’s Reply does not cure the deficiency in the Petition. To begin with, Petitioner’s Reply fails to articulate a construction for “service auto-configuration method,” but instead, as discussed above, relies on a definition that purports to be from Patent Owner’s expert, Dr. Litvin, and recites three characteristics: “(1) configuration by the DPOE system of both the ONU and OLT at the same time; (2) using a configuration file that includes configuration information of both the ONU and OLT; and, (3) configuration of the ONU and OLT occurs during ONU initialization.” Pet. Reply 3 (citing PO Resp. 18–19; Ex. 1016 ¶¶ 6–9); *see id.* at 5 (citing Ex. 1016 ¶¶ 10–14). Petitioner, however, does not assert this as its own construction, fails to perform a claim construction analysis, and does not even argue that this construction is correct. *Id.* Instead, Petitioner cites only its expert, Dr. Min, without explanation. *Id.* Moreover, Patent Owner itself affirmatively rejects this alleged construction and denies that Dr. Litvin offered a construction or performed a claim construction analysis of this term, so there is no agreement by the parties on this point. PO Sur-reply 5–6.

Additionally, the portions of Dr. Min’s Second Declaration cited by Petitioner rely on several sections of the ’982 patent but, as discussed below, they are insufficient to support the claim construction Petitioner ascribes to Patent Owner, and Dr. Min fails to sufficiently explain otherwise. *See* Ex. 1016 ¶¶ 6–14.

First, Dr. Min cites to Column 8, lines 19–31 of the ’982 patent, which states:

The DPOE system and the service auto-configuration method and network based on that system provided by the

embodiments of the present document complete the automatic configuration of the OLT and the ONU at the same time through a configuration file including the configuration information of the ONU and the configuration information of the OLT in the DPOE system; after the process of the ONU initialization is completed, the service can be opened without performing further configuration to the OLT individually. Especially, when more complex configurations are needed to be performed on the OLT correspondingly for the key service operation on the ONU, it can improve the configuration efficiency of the whole system very well.

Ex. 1001, 8:19–31; *see* Ex. 1016 ¶ 8. This portion of the '982 patent Specification, however, merely describes operations of the “service auto-configuration method” in “embodiments of the present document,” and does not define or construe the term “service auto-configuration method” itself.

Second, Dr. Min cites to Column 7, line 65 though Column 8, line two of the '982 patent, which states:

It can be seen from the above-mentioned embodiments that, compared with the related art, the present document adds the configuration information about the OLT of the DPOE system in the configuration file, and completes the automatic configuration on the OLT and the ONU at the same time.

Ex. 1001, 7:65–8:2. Although this portion of the Specification uses the term “automatic configuration,” it does not define or even use the term “service auto-configuration method.”

Petitioner and Dr. Min also rely on Figure 3 of the '982 patent, which depicts as follows:

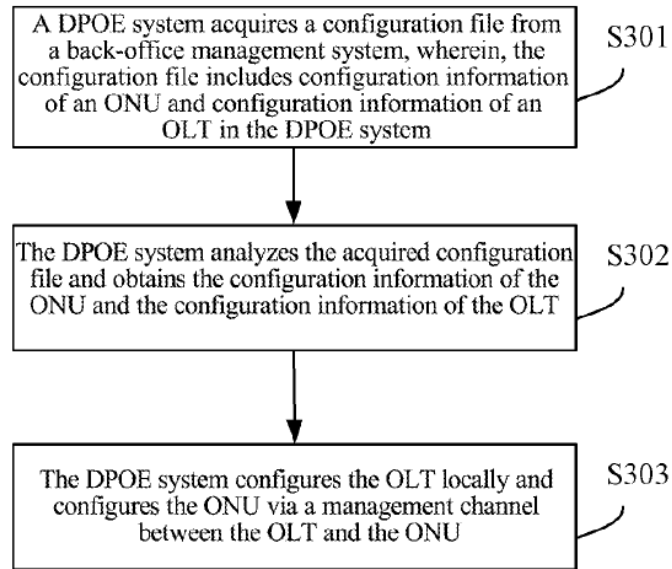


FIG. 3

Figure 3 of the '982 patent depicting steps S301–S303 of an embodiment of the invention. Ex. 1001, Fig. 3.

Pet. Reply 4; Ex. 1001, Fig. 3. The '982 patent, however, describes Figure 3 as “a flow chart of a service auto-configuration method of a DPOE system according to an embodiment of the present document.” Ex. 1001, 4:31–33. Thus, the '982 patent describes Figure 3 as a flow chart disclosing steps performed by an embodiment of a “service auto-configuration method,” rather than providing a definition of the term “service auto-configuration method” itself. Moreover, neither Petitioner nor Dr. Min performs a proper claim construction analysis on this portion of the '982 patent Specification or, indeed, on any portion of the '982 patent Specification.

We also find deficient Petitioner’s argument that Bernstein teaches a “service auto-configuration method” because the Petition explains how Bernstein teaches *other limitations* in the body of claim 1. Pet. Reply 5–6 (citing Pet. §§ VIII(A)(1))b–g), VIII(A)(5)(b–g)); *see id.* at 4 (citing Pet. §§

VIII(A)(1), VIII(A)(5), VIII(C)(1), and VIII(C)(5)). As discussed above, Petitioner fails, both in the Petition and the Reply, to make any proper claim construction argument for the term “service auto-configuration method.” Thus, Petitioner fails to make a proper claim construction argument that the term “service auto-correction method” is coterminous with steps set forth in the body of the claim and adds nothing to those steps.⁸ Without this claim construction, Petitioner does not demonstrate where the prior art meets the challenged limitation.

Consequently, we find that Petitioner has failed to prove by a preponderance of the evidence that the prior art teaches “[a] service auto-configuration method” as recited in the preamble of claim 1.

b. 1[b] analyzing the acquired configuration file

Petitioner argues that Bernstein’s DPoE system analyzes the acquired configuration file and obtains both the configuration information for the ONU and the configuration information for the OLT, as required by limitation 1[b]. Pet. 28. After downloading the configuration file, Petitioner asserts, Bernstein’s “DOCSIS-to-PON translator 84” in DPON 40 “analyzes the configuration file, obtaining configuration information of both the OLT and ONU, that it then converts ‘into associated PON parameters 63 that can

⁸ We are not persuaded by Petitioner’s argument that Dr. Litvin “agreed that the steps recited in [c]laim 1 ‘comprise a service auto-configuration method’” at his deposition. Pet. Reply 4 (citing Ex. 1017, 32:16–33:13). Dr. Litvin merely stated at his deposition that: “Claim 1 encompasses steps that comprise a service quota configuration method. I have no opinion whether that’s complete or not.” Ex. 1017, 33:7–9. This testimony merely states that the steps “comprise” such a method, and notes that other things may also be required. Moreover, Dr. Litvin does not perform a claim construction analysis or state that he is setting forth a construction of the term “service auto-configuration method.”

be used by the OLT 18 and ONU 24.” *Id.* (citing Ex. 1005 ¶ 66 (citing Ex. 1006, 3:53–63)). The portion of Bernstein cited by Dr. Min (and referenced in the Petition) states as follows:

A DOCSIS-to-PON translator 84 is then used for converting any of the parameters 61 obtained by the cable modem proxy 60 into associated PON parameters 63 that can be used by the OLT 18 and ONU 24. Some of the translated PON parameters 63 are programmed into a PON driver 86 for either communicating with the ONU 24 or sent over the optical cable 20 for configuring the ONU 24. The PON driver 86 represents any of the EPON 64, GPON 66, or WDM 68 previously shown in FIG. 2. The translated PON parameters 63 may also be used for operating or configuring OLT hardware 88.

Ex. 1006, 3:53–63; *see* Pet. 28; Ex. 1005 ¶ 66.

According to Petitioner, Bernstein explains that this information is used to configure both the ONU and OLT when it states that “[s]ome of the translated PON parameters 63 are programmed into a PON driver 86 [of the OLT 18] for either communicating with the ONU 24 or sent over the optical cable 20 for configuring the ONU 24.” Pet. 28 (citing Ex. 1005 ¶ 67). Petitioner also points to Bernstein’s disclosure that “[t]he translated PON parameters 63 may also be used for operating or configuring OLT hardware 88.” *Id.*

In our Institution Decision, we preliminarily agreed with Patent Owner that the terms “analyzing” and “converting” are not the same, but noted that we did not see any language in claim 1 that precludes the step of “analyzing” from being part of the process that performs “conversion.” Inst. Dec. 33. We noted that Dr. Min testified that Bernstein’s process, which converts parameters, also analyzes the configuration file, and that the record provided a sufficient basis for purposes of institution to conclude that Bernstein analyzes the acquired configuration file. *Id.* (citing Ex. 1005 ¶ 96; Prelim.

Resp. 29).

In its Response, Patent Owner argues that the Petition “fail[s] to explain how Bernstein renders obvious the ‘analyzing’ elements” in this limitation. PO Resp. 24. Patent Owner asserts that the portion of Bernstein upon which Petitioner relies describes “converting” and “translating” parameters obtained by a cable modem proxy, but does not discuss “analyzing” that information. *Id.* at 25 (citing Ex. 2008 ¶ 48). Patent Owner also contends that the claim language of the ’982 patent demonstrates that “analyzing” is different from “converting” because it recites “wherein, **when analyzing** the acquired configuration file, the DPOE system **further converts** the configuration information.” *Id.* at 27. Thus, Patent Owner argues, “the claim differentiates between ‘analyzing’ and ‘converting.’” *Id.* “Because analyzing and converting are two separate steps in the claims of the ’982 [p]atent,” Petitioner argues, “the terms must mean different things.” *Id.* Finally, Patent Owner argues that neither Petitioner nor Dr. Min adequately explains how Bernstein analyzes the configuration file or why “converting” in Bernstein renders obvious “analyzing” in the claim. *Id.* at 25 (citing Ex. 2008 ¶ 48), 27–28 (citing Ex. 2008 ¶¶ 45–53; Ex. 1005 ¶¶ 66–68, 95–96).

Petitioner responds that the Petition and Dr. Min both explicitly state that the recited “analyzing” is performed as part of Bernstein’s “converting” process, citing to Column 3, lines 53–63, the same portion of Bernstein cited in the Petition. Pet. Reply 7 (citing Pet. 28 (citing Ex. 1006 ¶ 66 (citing Ex. 1006, 3:53–63))). Petitioner asserts that the Board correctly determined in the Institution Decision that there is no claim language precluding “analysis” during the “process of conversion,” and argues that the claim explicitly recites that the two steps occur as part of a single process when it

states: “when analyzing the acquired configuration file, the DPOE system further converts[.]” *Id.* at 8 (citing Inst. Dec. 33).

Petitioner also argues that it is axiomatic that a conversion process must include some level of analysis because one must first determine the format and content of a piece of information to translate or convert it into equivalent content in another format. Pet. Reply 8. Petitioner provides the example of converting text from one language into another, in which one must first analyze the text to determine its language and analyze the specific words to ascertain both their content and context before it can perform the translation, such as from “casa” into “home.” *Id.* Petitioner provides another example of converting from one system of measurement to another (such as feet in United States customary to meters in the metric system), where one must first determine the initial system, unit, and value for the information (e.g., 1 foot) and then apply the correct conversion methodology to convert the specific measurement to the desired system (e.g., 0.3048 meters). *Id.* at 8 n.4 (citing Ex. 1016 ¶ 21). Petitioner argues that the same is necessarily true in Bernstein’s process for converting DOCSIS parameters to PON parameters, because Bernstein’s translator first “analyzes” the file to identify the parameters intended for the ONU and the OLT before converting those parameters in the configuration file from DOCSIS to parameters understandable by a PON. *Id.* at 8 (citing Pet. 28 (citing Ex. 1005 ¶ 66 (citing Ex. 1006, 3:53–63))); Ex. 1016 ¶ 21).

Petitioner further argues that Dr. Litvin confirmed that conversions such as Bernstein’s entail analysis when he stated that because “there is no particular order specified in which the individual configuration setting[s] [in a DOCSIS configuration file] must be arranged, . . . the file **must be**

‘analyzed’ so that the DPOE system can parse the contents of the file.” Pet. Reply 9 (citing Ex. 2008 ¶¶ 51–52; Ex. 1017, 46:16–49:22). Petitioner argues that Bernstein uses such DOCSIS configuration files, and that Dr. Litvin does not explain why one of ordinary skill would conclude that Bernstein’s DOCSIS configuration files differ from those with which he or she was otherwise familiar. *Id.* (citing Pet. 26 (citing Ex. 1005 ¶ 26 (citing Ex. 1005 5:31–32)), 38). Citing to Dr. Min’s testimony, Petitioner criticizes as “baseless” Dr. Litvin’s conclusion that the analysis generally expected would not have occurred in Bernstein. *Id.* (citing Ex. 1016 ¶¶ 22–27).

Additionally, Petitioner argues that Bernstein’s description of Figure 4 shows that Bernstein’s DOCSIS-to-PON translation process includes analysis, because that embodiment uses two translators (84a and 84b) to automatically configure both the OTL and ONU contemporaneously. Pet. Reply 9 (citing Pet. 35–36 (citing Ex. 1005 ¶ 82)). Because each translator discriminates between OLT and ONU parameters, Petitioner contends, they “analyze” the contents of the configuration file. *Id.* (citing Pet. 35–36; Ex. 1016 ¶ 28).

Patent Owner responds that Petitioner’s argument that “converting” a file necessarily discloses “analyzing” a file is an improper new argument not raised in the Petition. PO Sur-reply 8. According to Patent Owner, the Petition only argues that Bernstein’s DOCSIS-to-PON translator, which converts parameters obtained by the cable modem proxy, teaches the claimed “analyzing.” *Id.* at 8–9 (citing Pet. 28). Patent Owner asserts that Petitioner’s Reply “now points to entirely separate embodiments of Bernstein,” namely Figure 4 and the discussion at Column 5, lines 31–32,” and also points to arguments in other portions of the Petition. *Id.* at 10 (citing

Pet. Reply 8–9). According to Patent Owner, these arguments are new grounds of obviousness, and none of these separate embodiments were raised in the Petition. *Id.* Patent Owner does not otherwise address the arguments presented for this claim limitation in Petitioner’s Reply. *Id.* at 8–10.

Based on the full trial record, we find that Petitioner has shown by a preponderance of the evidence that Bernstein discloses the claimed “analyzing.” To begin with, Bernstein discloses that CM Proxy 60 obtains a TFTP download configuration file 102 file that contains configuration information for an ONU and OLT from the a back office management system. Ex. 1006, 5:31–32 (“the CM proxy 60 may send a TFTP request for a DOCSIS configuration file download”), 5:32–34 (“[t]he TFTP server 52 replies with a TFTP download configuration file 102”), 5:34–36 (“The information in the TFTP file 102 is then translated and used for configuring schedule/classifiers or other features on the OLT 18 and ONU 24.”), Fig. 7 (Ref. 100, TFTP-REQ-CFG-FILE); Pet. 25, 26; Ex. 1005 ¶¶ 60, 63.

Bernstein goes on to explain that “[t]he information in the TFTP file 102 is then translated and used for configuring schedule/classifiers or other features on the OLT 18 and ONU 24.” Ex. 1006, 5:34–36. Bernstein describes the analysis, conversion, and translation of the configuration file as follows:

A DOCSIS-to-PON translator 84 is then used for converting any of the parameters 61 obtained by the cable modem proxy 60 into associated PON parameters 63 that can be used by the OLT 18 and ONU 24. Some of the translated PON parameters 63 are programmed into a PON driver 86 for either communicating with the ONU 24 or sent over the optical cable 20 for configuring the ONU 24. The PON driver 86 represents any of the EPON 64, GPON 66, or WDM 68 previously shown in

FIG. 2. The translated PON parameters 63 may also be used for operating or configuring OLT hardware 88.

Ex. 1006, 3:53–63.

Although this paragraph does not expressly use the word “analyzing,” we agree with Petitioner that this disclosure involves “analysis,” because the system must first determine the format and content of the information in TFTP file 102 before it can convert or translate that information into equivalent content in another format. *See* Pet. Reply 8. Thus, Bernstein’s translator first “analyzes” the configuration file to locate and identify the parameters intended for the ONU and OLT and determine their format and content, before converting those parameters to ones understandable by a PON. *See* Pet. Reply 8; Ex. 1005 ¶ 66; Ex. 1016 ¶ 21. We find Dr. Min’s testimony credible and agree that one of ordinary skill would have understood that the cited portions of Bernstein include “analysis” because “at a fundamental level, no translation may take place without some level of analysis as one must first determine the format and content of a piece of information to translate or convert it into another form.” Ex. 1016 ¶ 21. We also agree with Dr. Min that one of ordinary skill would have understood that Bernstein’s translator would not output PON parameters “without first determining which specific parameters and values are included in the configuration file,” and that this determination constitutes “analysis.” *Id.*

Similarly, we agree with Petitioner that Bernstein discloses “analysis” that is distinct from “conversion” or “translation.” *See* Pet. Reply 7–8. In Bernstein, as discussed above, the “analysis” includes reviewing the format and content of the information and content of the configuration file, and determining what information to pass on for conversion into a form that can be understood by the OLT and ONU. This “analysis” precedes and is distinct

from the conversion or translation of those parameters into a form that can be understood by the OLT and ONU.

Our understanding also is consistent with the way Dr. Litvin discusses “analyzing” in the context of a DOCSIS system. Specifically, Dr. Litvin testifies that “an example of ‘analyzing’ can be seen in the modern DOCSIS specification,” where the configuration file consists of a number of individual configuration settings of the form Type Length Value (TLV) arranged in no particular order. Ex. 2008 ¶¶ 51–52. Dr. Litvin goes on to explain:

The DPOE system does not know in advance what is contained in the file nor the order of these settings. Hence, *prior to any potential needed format converting, and before any provisioning can take place, the file must be “analyzed” so that the DPOE system can parse through the content of the file.* Only then will it be able to take the appropriate action for each of the individual configuration settings contained within the configuration file. In this case, *analyzing the file could mean extracting the individual TLV configuration settings, determining their intent* (possibly by comparing to known values in a lookup table of TLVs stored in local memory or by other algorithmic means) *and then taking appropriate action according to each individual configuration setting.*

Id. ¶ 52 (emphasis added). This example of “analyzing” the configuration file is comparable to Bernstein’s “analysis” of the configuration file to identify the parameters intended for the ONU and OLT before converting those parameters in the configuration file to parameters understandable by a PON. See Ex. 1016 ¶¶ 22–25.

We further find that Petitioner’s contentions in the Reply upon which we rely are not improper new arguments. See PO Sur-reply 8–10. The Petition argues that Bernstein’s DPON 40 (including DOCSIS-to-PON translator 4) “analyzes” the configuration file to “obtain[] configuration information of both the OLT and ONU” before that information is converted

“into associated PON parameters 63 that can be used by the OLT 18 and ONU 24.” Pet. 28; Ex. 1005 ¶ 66. Petitioner’s Reply simply expands upon the Petition to further flesh out the “analysis” that is performed on the configuration file before the “conversion” step, and responds to Patent Owner’s arguments in the Response that Petitioner does not explain sufficiently how Bernstein performs “analysis” or how “analysis” is different from “conversion.” Pet. Reply 7–10; PO Resp. 25–28. Moreover, although Patent Owner contends that the argument in Petitioner’s Reply based on Bernstein’s Figure 4 is an improper new argument, we do not rely on Bernstein’s Figure 4 in reaching our conclusions here.

Consequently, we find that Petitioner has proven by a preponderance of the evidence that Bernstein discloses this limitation.

c. Summary for Claim 1

As discussed above, we find that Petitioner has not proven by a preponderance of the evidence that the preamble is taught by Bernstein alone or in combination with Tsuge. Therefore, we find that Petitioner has not proven by a preponderance of the evidence that claim 1 is unpatentable over Bernstein alone or in combination with Tsuge.

5. Dependent Claim 2

Claim 2 depends from claim 1 and further recites that “the configuration information of the OLT is configuration information related to services opened by the ONU.” Ex. 1001, 8:58–60. Because, as discussed above, Petitioner has not proven by a preponderance of the evidence that claim 1 is unpatentable over Bernstein alone or in combination with Tsuge, Petitioner also has not proven that dependent claim 2, which depends from claim 1, is unpatentable over Bernstein alone or in combination with Tsuge.

6. Dependent Claim 5

Claim 5 depends from claim 4 which, as discussed above, has been disclaimed. Ex. 1001, 9:23–29; Prelim. Resp. 14 n.1; Ex. 2007. Claim 5 (which includes the limitations of claim 4) is similar in many respects to claim 1, but does not include the “service auto-configuration” language in the preamble. The only disputed issue between the parties with respect to claim 5 (which includes the limitations of independent claim 4) involves the “analyzing” language in limitation 4[c], which states that “the analyzing unit is configured to analyze the acquired configuration file and obtain both the configuration information of the ONU and the configuration information of the OLT.” Ex. 1001, 9:13–16. For the “analyzing” language of limitation 4[c], Petitioner points to its argument for limitation 1[b], and Patent Owner argues limitations 1[b] and 4[c] together. Pet. 48–49; PO Resp. 24–28. For the reasons set forth with respect to limitation 1[b] above, we find that Petitioner has proven by a preponderance of the evidence that Bernstein discloses limitation 4[c]. *See* § III.A.4(b), *supra*.

Petitioner provides an element-by-element analysis of the remaining limitations of claims 4 and 5, including citations to expert testimony and other evidence of record. Pet. 46–50. Patent Owner does not present argument as to any of these remaining limitations. PO Resp. 20–30. After fully considering and analyzing the arguments and evidence provided by Petitioner, we find that Petitioner has sufficiently carried its burden of proving that these limitations would have been obvious over Bernstein alone or in combination with Tsuge.

Consequently, we find that Petitioner has proven by a preponderance of the evidence that claim 5 is unpatentable over Bernstein alone or in combination with Tsuge.

7. Claims 6–9 and 11.

Independent claim 6 is similar in many respects to claim 1, and includes the same “service auto-configuration” language in the preamble as in the preamble of claim 1, as well as “analyzing” language in limitation 6[d] that is similar to the “analyzing” language previously discussed in the context of limitation 1[b]. Ex. 1001, 9:31–10:14. Petitioner relies on its arguments for claims 1 and 4 for claim 6. Pet. 50–53. Patent Owner disputes Petitioner’s showing for the “service auto-configuration” language in the preamble and the “analyzing” language in limitation 6[d], relying on the same arguments and evidence as for the comparable limitations in claim 1. PO Resp. 20–28. For the reasons discussed above with respect to claim 1, we find that Petitioner has sufficiently proven that Bernstein, alone or in combination with Tsuge, teaches the “analyzing” language in limitation 6[d], but that Petitioner has failed to make a sufficient showing with respect to the “service auto-configuration” language in the preamble. *See* § III.A.4, *supra*. Consequently, we find that Petitioner has failed to prove by a preponderance of the evidence that claim 6 is unpatentable based on Bernstein alone or in combination with Tsuge.

Claims 7–9 and 11 depend from claim 6. Because Petitioner has failed to sufficiently prove that claim 6 is unpatentable, Petitioner has necessarily also failed to prove that dependent claims 7–9 and 11 are unpatentable.

B. Ground 2: Alleged Obviousness of Claims 3 and 10 Over Bernstein, MEF 6.1 and/or Tsuge

Petitioner argues that dependent claims 3 and 10 would have been obvious over Bernstein in combination with MEF 6.1 and/or Tsuge. Pet. 22. Claim 3 depends from claim 1 and claim 10 depends from claim 6. Because Petitioner has failed to sufficiently prove that claims 1 and 6 are

unpatentable, Petitioner has necessarily also failed to prove that dependent claims 3 and 10 are unpatentable. *See* §§ III.A.4, III.A.7, *supra*.

C. Ground 3: Alleged Obviousness of Claims 1, 2, 5–9, and 11 Over Tsuge and Bernstein

Petitioner argues that claims 1, 2, 5–9, and 11 would have been obvious over Tsuge alone or in combination with Bernstein. Pet. 22; Ex. 2007.

1. Independent Claim 1

In this challenge, the parties dispute three limitations of claim 1: (1) the “service auto-configuration method” in the preamble; (2) the “back-office management system” in limitation 1[a]; and (3) “converting configuration information for the OLT into a message format” in limitation 1[g]. These issues will be discussed below.

a. 1[preamble] a service auto-configuration method

As noted above with respect to Ground 1, the preamble of independent claim 1 recites a “service auto-configuration” method. *See* § III.A.4(a). Petitioner’s arguments for the preamble of claim 1 in Ground 3 suffer from similar infirmities as the arguments for the preamble of claim 1 in Ground 1.

As discussed previously, the parties agree that the preamble of claim 1, including the “service auto-configuration method” language, is limiting. *See* § II.B, *supra*. As we explained in the Institution Decision, the Petition does not set forth a construction of “service auto-configuration” or explain how Tsuge or Bernstein discloses a “service auto-configuration” method. Pet. 11, 60; Inst. Dec. 14, 42. Instead, the Petition merely asserts that Tsuge teaches “a DOCSIS Provisioning of EPON (DPoE) system” by disclosing “a method for provisioning DOCSIS services on ONU/OLT hardware in a ‘GE-PON’ (*i.e.*, Gigabyte Ethernet PON), or any other type of PON,” without explaining

how it teaches a “service auto-configuration” method. Pet. 60 (citing Ex. 1005 ¶ 132 (citing Ex. 1008, 6:47–55, 14:40–15:22)). By failing to offer a construction of “service auto-configuration method,” or explain how this limitation is met by the prior art, the Petition fails to show by a preponderance of the evidence that the prior art discloses or suggests this limitation.

As in Ground 1, Petitioner’s Reply does not cure the infirmities of the Petition. *See* § III.A.4(a), *supra*. In the Reply, Petitioner does not present a construction for a “service auto-configuration method,” but instead points to what it contends is Patent Owner’s interpretation of the term. Pet. Reply 14. Petitioner relies on the same purported interpretation of the term as in Ground 1, namely that a “service auto-configuration method” has three characteristics: (1) configuration of the ONU and OLT at the same time; (2) a configuration file including configuration information of the ONU and configuration information of the OLT; and (3) configuration of the ONU and OLT occurring during an ONU initialization process. *Id.* As noted in our analysis of Ground 1, Petitioner does not assert this as its own construction, perform a claim construction analysis, or even state that this construction is correct. *Id.* at 14–15; § III.A.4(a), *supra*. And, as explained with respect to Ground 1, Patent Owner itself affirmatively rejects this construction and denies that Dr. Litvin offered a construction or performed a claim construction analysis of this term, so there is no agreement by the parties on this point. PO Sur-reply 5–6; § III.A.4(a), *supra*. And, as discussed with respect to Ground 1, the portions of Dr. Min’s Second Declaration that Petitioner points to in order to support this interpretation are insufficient to

support a construction of that term, and Dr. Min fails to provide sufficient analysis explaining otherwise. *See* Ex. 1016 ¶¶ 6–14; § III.A.4(a), *supra*.

As in Ground 1, we also find deficient Petitioner’s argument that it has shown that Tsuge teaches a “service auto-configuration method” because the Petition explains how Tsuge teaches *other limitations* in the body of claim 1 that make up the “service auto-configuration method.” Pet. Reply 15 (citing Pet. §§ VIII(C)(1), VIII(C)(5)). As discussed above, Petitioner fails, either in the Petition or the Reply, to make any proper claim construction argument for the term “service auto-configuration method.” Thus, Petitioner fails to provide sufficient support that the term “service auto-configuration method” should be construed to be coterminous with the steps set forth in the body of the claim and not involve any additional limitations.

Petitioner also argues that Tsuge Column 14, line 40 to Column 15, line 22, cited in the Petition, describes each of the three elements of the construction of “service auto-configuration” above that Petitioner ascribes to Patent Owner, when it “discusses Tsuge’s DPOE system which, during an initialization process of ONU, obtains a configuration file, analyzes it and uses the information in the file to configure both the ONU and OLT at the same time.” Pet. Reply 14 (citing Pet. 60; Ex. 1016 ¶¶ 38–43). As discussed above, the interpretation of “service auto-configuration” that Petitioner ascribes to Patent Owner is unsupported and disputed by Patent Owner, and therefore Petitioner fails to show that Tsuge meets the “service auto-configuration” limitation under a proper construction of that term. Moreover, as Patent Owner points out, Petitioner points to more than 40 lines of Tsuge without identifying where the specific teachings of a “service auto-configuration method” is taught. *See* PO Sur-reply 11–12.

Petitioner argues Figure 15 “discloses a ‘CMTS/CM Apparatus Management Network 232’ comprising a conventional DOCSIS back-office management system [PURPLE] that, *inter alia*, stores and provides DOCSIS configuration files.” Pet. 61.

In its Response, Patent Owner argues that, in the related district court litigation, Petitioner proposed a narrow construction of the term “back-office management system” to mean “a system comprising network management equipment within a DPoE Network, which includes a Trivial File Transfer Protocol (TFTP) Server and Dynamic Host Control Protocol (DHCP) Server.” PO Resp. 34. Patent Owner states that it disagrees with this construction, but that Petitioner fails to identify “a back office management system” in Tsuge or Bernstein that meets this construction because it fails “to identify a DHCP server as part of network management system.” *Id.* (citing Ex. 2008 ¶ 70). Patent Owner does not argue that Tsuge fails to disclose a “back-office management system” under the ordinary meaning of the term. *Id.* at 34–37.

In its Reply, Petitioner states that Patent Owner mischaracterizes the parties’ claim constructions in the related district court litigation and points to a declaration of Dr. Litvin in the related litigation stating that the parties have agreed that the term “back-office management system” in claim 1 should be given its “plain and ordinary meaning” and “no construction [is] necessary.” Pet. Reply 17 (citing Ex. 1018, 8). In its Sur-reply, Patent Owner confirms that “[b]etween the filing of Patent Owner’s Response and Petitioner’s Reply, Petitioner dropped its proposed construction of a ‘back-office management system’” in the related district court litigation. PO Sur-reply 14. During the oral hearing in this case, Petitioner acknowledged that it is now asserting that

“back-office management system” should be given its plain and ordinary meaning, and Patent Owner agreed that there is no longer a dispute concerning whether Tsuge discloses a “back-office management system.” Tr. 26:7–28:4, 29:6–8, 54:12–55:2.

Consequently, the parties now agree that “back-office management system” should be given its plain and ordinary meaning, therefore we apply the plain and ordinary meaning for purposes of this Decision. After reviewing and analyzing the full trial record, we find that Petitioner has proven by a preponderance of the evidence that Tsuge discloses a “back-office management system” under the ordinary meaning of that term, which Patent Owner does not appear to dispute.

c. 1[g] “converting configuration information of the OLT into a message format”

With respect to limitation 1[g], the parties dispute whether Tsuge discloses that the DPoE system “converts the configuration information of the OLT into a message format which can be identified by the OLT.” Pet. 72–73; PO Resp. 31–34; Pet. Reply 15–17; PO Sur-reply 12–14.

Petitioner argues that “Tsuge explains the CM setting information is converted ‘into settings to the OLT itself.’” Pet. 72–73 (citing Ex. 1005 ¶ 152 (citing Ex. 1008, 4:46–51)). Petitioner asserts that Figure 9 of Tsuge “depicts storage of upstream communications bandwidth setting information into a setting for the LLID in the OLT as part of the OLT-ONU setting sequence 930 (step 1810).” *Id.* (citing Ex. 1008, 18:25–36).

Petitioner also argues that it would have been obvious to one of ordinary skill, in light of the teachings of Bernstein, “to convert CM setting information into a message format [that] would be understood by the OLT, because the setting information would otherwise be unusable.” Pet. 73

(citing Ex. 1005 ¶ 153). According to Petitioner, one of ordinary skill “would have understood how to make such a conversion and would have had a reasonable expectation of success in doing so.” *Id.*

Patent Owner responds that the portions of Tsuge that Petitioner cites for converting “CM setting information” into “settings of the OLT itself” and storage of those settings in the OLT do not “describe converting information of the OLT into a message format that can be read by the OLT.” PO Resp. 31–32 (citing Pet. 72–73, 77; Ex. 1008, 4:46–51, 18:25–36); Ex. 2008 ¶¶ 64–68.

With respect to the first portion of Tsuge cited by Petitioner, Patent Owner argues that this portion “says nothing about converting the setting information at all, much less converting it to a message format which can be identified by the OLT.” PO Resp. 32 (citing Ex. 1008, 4:46–51; Ex. 2008 ¶ 65). Instead, according to Patent Owner, this portion of Tsuge “distinguishes between OLT setting, which requires no conversion, and ONU setting, which uses ‘the protocol of the PON interval.’” *Id.* at 32 (citing Ex. 1008, 4:46–51; Ex. 2008 ¶ 65). With respect to the second portion of Tsuge, Patent Owner argues that this portion “simply explains that CM setting information corresponds to the ONU and that setting information may include various settings,” but does not “suggest[] ‘converting’ anything.” PO Resp. 32–33 (citing Ex. 1008, 18:25–36; Ex. 2008 ¶ 66).

Patent Owner disputes that it would have been obvious to convert the CM setting information into a message format that could be understood by the OLT, and argues that “Petitioner’s only reasoning for this modification is that ‘the setting information would otherwise be unusable.’” PO Resp. 33 (citing Pet. 73). Patent Owner contends that “[t]his naked assertion is merely

repeated by Petitioner’s expert,” and that “Petitioner provided no other evidence to support this conclusion.” *Id.* (citing Ex. 1005 ¶ 153; Ex. 2008 ¶ 67).

Additionally, Patent Owner argues that Tsuge “does not state that the CM setting information needs to be converted.” PO Resp. 33–34 (citing Ex. 1008, 4:46–51; Ex. 2008 ¶ 68). “In other words,” Patent Owner asserts, “Tsuge suggests that CM setting information is provided in a format that the OLT can understand natively.” *Id.* “Because nothing in Tsuge suggests that reflection requires any change to the format of the CM setting information,” Patent Owner contends, “Petitioner has not shown Tsuge renders obvious claims 1 and 5.” *Id.*

Petitioner responds by again referring to the portions of Tsuge discussing the conversion of parameters into settings to the OLT that it previously cited in the Petition and in Dr. Min’s Declaration. Pet. Reply 15–16 (citing Pet. 60, 62–63; Ex. 1005 ¶¶ 132, 135, 137, 141). Petitioner also argues that Petitioner’s assertion that “OLT configuration in Tsuge arrives in a format that need not be converted” is incorrect. *Id.* at 16 (citing Ex. 1008 14:67–15:15). According to Petitioner, this passage of Tsuge “shows that in Tsuge’s primary embodiment, OLT configuration information must first be converted before it can be ‘reflected’ to the OLT.” *Id.* at 16–17 (emphasis omitted). In its Sur-reply, Patent Owner argues that this portion of Tsuge is not cited in the Petition and is improperly raised for the first time in the Reply. PO Sur-reply 12–13.

Based on the full trial record, we agree with Patent Owner that Petitioner has failed to sufficiently prove that Tsuge discloses converting the configuration information of the OLT into a *message format* that can be

identified by the OLT. We agree with Patent Owner that Tsuge does not describe converting configuration information into a “message format” for the OLT. *See* PO Resp. 31–33. The only explanation or support for converting this information into a “message format” for the OLT is Petitioner’s conclusory attorney argument that:

it would have been obvious to a POSA, in light of their knowledge and/or in light of the teachings of Bernstein, to convert CM setting information into a message format [that] would be understood by the OLT, because the setting information would otherwise be unusable.

Pet. 73 (citing Ex. 1005 ¶ 153). The cited portion of Dr. Min’s Declaration merely repeats this conclusory assertion verbatim without providing further explanation or evidence. Ex. 1005 ¶ 153.

We are not persuaded by Petitioner’s conclusory assertion that conversion into a “message format” would have been obvious because “the setting information would otherwise be unusable.” Pet. 73; Ex. 1005 ¶ 73. Petitioner does not explain what is meant by a “message format,” or why such a message format would be necessary to provide the conversion information to the OLT. Nor does Petitioner explain whether other formats might exist or be usable for this purpose. *Id.* Moreover, although Petitioner cites the “knowledge” of one of ordinary skill and references Bernstein and Ground 1 of the Petition, neither Petitioner nor Dr. Min provides sufficient analysis or explanation of what disclosures of Bernstein or knowledge in the art it is relying on, how Bernstein or such knowledge in the art would be combined with Tsuge, or what the rationale to combine would have been for an ordinarily skilled artisan. *Id.* As the Federal Circuit stated in *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016), “[t]o satisfy its burden of proving obviousness, a petitioner cannot employ mere

conclusory statements.” Rather, “[t]he petitioner must articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *Id.*

Consequently, we find that Petitioner has failed to prove by a preponderance of the evidence that limitation 1[g] is taught by the prior art.

d. Summary for Claim 1

As discussed above, we find that Petitioner has not proven by a preponderance of the evidence that the preamble and limitation 1[g] are taught by Tsuge alone or in combination with Bernstein. Therefore, we find that Petitioner has not proven by a preponderance of the evidence that claim 1 is unpatentable over Tsuge alone or in combination with Bernstein.

2. Dependent Claim 2

As noted previously, claim 2 depends from claim 1 and further recites that “the configuration information of the OLT is configuration information related to services opened by the ONU.” Ex. 1001, 8:58–60. Because, as discussed above, Petitioner has not proven by a preponderance of the evidence that claim 1 is unpatentable over Tsuge alone or in combination with Bernstein, Petitioner also has not proven that dependent claim 2, which depends from claim 1, is unpatentable over Tsuge alone or in combination with Bernstein.

3. Claim 5

As noted previously, claim 5 depends from claim 4, and is similar in many respects to claim 1, but does not include the “service auto-configuration” language in the preamble. Ex. 1001, 9:23–29. However, claim 5 includes similar language as in limitation 1[g] reciting “convert[ing] the configuration information of the OLT into a message format which can be

identified by the OLT,” and the parties rely on the same arguments and evidence for both limitation 1[g] and claim 5. Pet. 77; PO Resp. 31–34.

As discussed previously, we find that Petitioner has failed to prove by a preponderance of the evidence that limitation 1[g] is unpatentable based on Tsuge alone or in combination with Bernstein. *See* § III.C.1(g). Because claim 5 includes a comparable limitation, we also find that Petitioner has failed to prove by a preponderance of the evidence that claim 5 is unpatentable based on Tsuge alone or in combination with Bernstein.

7. Claims 6–9 and 11.

As noted previously, independent claim 6 is similar in many respects to claim 1, and includes the “service auto-configuration” language in the preamble. Ex. 1001, 9:31–10:14. Petitioner relies on its arguments for claims 1 and 4 for claim 6. Pet. 78–82. Patent Owner disputes Petitioner’s showing for the “service auto-configuration” language in the preamble, relying on the same arguments and evidence as for that limitation in claim 1. PO Resp. 30–31. For the reasons discussed above with respect to claim 1, we find that Petitioner has failed to make a sufficient showing that Tsuge, alone or in combination with Bernstein, teaches the “service auto-configuration” language in the preamble. *See* § III.C.1(a), *supra*. Consequently, we find that Petitioner has failed to prove by a preponderance of the evidence that claim 6 is unpatentable based on Tsuge alone or in combination with Bernstein.

Claims 7–9 and 11 depend from claim 6. Because Petitioner has failed to sufficiently prove that claim 6 is unpatentable, Petitioner has necessarily also failed to prove that dependent claims 7–9 and 11 are unpatentable.

D. Ground 4: Alleged Obviousness of Claims 3 and 10 Over Tsuge, MEF 6.1 and/or Bernstein

Petitioner argues that dependent claims 3 and 10 would have been obvious over Bernstein in combination with MEF 6.1 and/or Tsuge. Pet. 84–86. Claim 3 depends from claim 1 and claim 10 depends from claim 6. Because Petitioner has failed to sufficiently prove that claims 1 and 6 are unpatentable, Petitioner has necessarily also failed to prove that dependent claims 3 and 10 are unpatentable.

V. CONCLUSION

For the foregoing reasons, we are persuaded that Petitioner has established by a preponderance of the evidence that claim 5 of the '982 patent is unpatentable, and has not established by a preponderance of the evidence that claims 1–3 and 6–11 are unpatentable.⁹

In summary:

Claim(s) Challenged	35 U.S.C. §	Reference/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 5–9, 11	103	Bernstein, Tsuge	5	1, 2, 6–9, 11
3, 10	103	Bernstein, MEF 6.1, Tsuge		3, 10

⁹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

Claim(s) Challenged	35 U.S.C. §	Reference/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 5–9, 11	103	Tsuge, Bernstein		1, 2, 5–9, 11
3, 10	103	Tsuge, MEF 6.1, Bernstein		3, 10
Overall Outcome			5	1–3, 6–11

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claim 5 of the '982 patent has been shown to be unpatentable; and

FURTHER ORDERED that claims 1–3 and 6–11 of the '982 patent have not been shown to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 9,287,982 B2

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