

Petition for *Inter Partes* Review  
U.S. Patent No. 8,155,298

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YMAX CORPORATION,  
Petitioner

v.

FOCAL IP, LLC,  
Patent Owner

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*Inter Partes* Review No.: Unassigned

U.S. Patent No. 8,155,298

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**DECLARATION OF TAL LAVIAN, PH.D.  
IN SUPPORT OF THE PETITION FOR  
INTER PARTIES REVIEW OF PATENT NO. 8,155,298**

CISCO SYSTEMS, INC. v. FOCAL IP, LLC

telephone call between two landline telephones is established, there is a continuous physical path of wires, linked by one or more switches, between the telephones at each end of the call that is dedicated solely to that call. This is the meaning of the term “circuit switching.” The term refers to the switching of infrastructure from one dedicated use to another. The network focus is on circuit-based, or connection-oriented, systems designed for delivery of voice communications.

40. Even more specifically, the PSTN uses a hierarchy of switches.<sup>4</sup> This makes it possible to scale the telecommunications network to accommodate a large number of end users across the country. Traffic is managed between the various switching offices depending on the type of traffic that was to be connected: local traffic, long distance traffic, and international traffic.

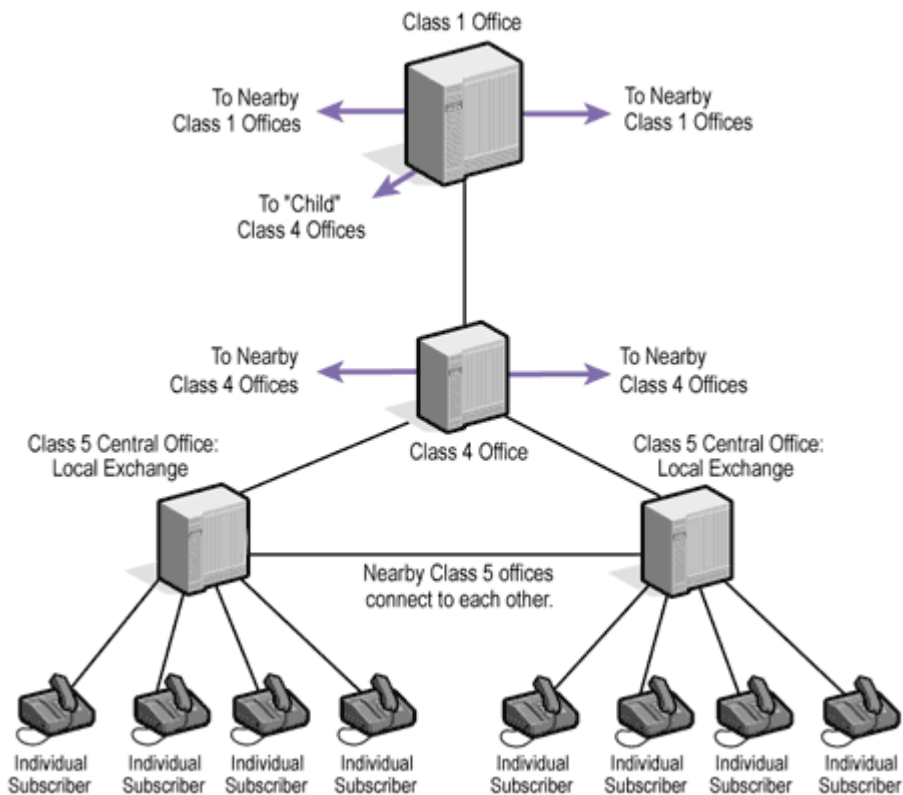
41. The switches in the PSTN use a five-level hierarchy: edge or end (class 5), toll or tandem (class 4), primary (class 3), sectional (class 2) and regional (class 1). Landline phones in people’s houses are generally connected to a geographically local class 5 switch (also be called an edge switch, end switch, or central office switch). Telephones in different geographic areas are connected to different edge switches in different central offices. Tandem/Class 4 switches generally connect edge/class 5 switches together, although nearby class 5 switches can be connected directly. In the PSTN, class 2 and 3 switches are used

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<sup>4</sup> See Ex. 1012.

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infrequently, and class 4 switches can be connected to one another as well as by a class 1 switch. The basic architecture of the PSTN can therefore be illustrated by the following diagram:



42. The PSTN switch hierarchy does not mandate physical separation. Switches from one or more adjacent classes (specifically edge and tandem) can be located together in the same physical facility. A combined class 4/class 5 switch is often called a “hybrid” switch.

43. When a telephone call is placed on the PSTN, the call typically travels from the caller’s phone to the edge switch in the caller’s local central office.

Unless the recipient is in the same geographical area and directly connected to the same central office, the call is then typically routed to one or more tandem switches (in sequence), until it reaches the edge switch that is directly connected to the recipient's phone, and finally to the recipient's phone. The switches use the telephone number dialed by the caller to know where to route the call. Thus, the network of switches enables the communication network to connect users either within or outside a local geographic area.

## B. Signaling

44. In addition to carrying voice communications, the PSTN also carries signaling, which is information used to control the call. Signaling communicates information the network needs to operate, such as the signal sent to the local central office from a telephone when the handset is picked up that notifies the central office to send the telephone a dial tone, or the signal from the central office that tells a telephone to ring because there is an incoming call. The protocol that is used for signaling on the PSTN is called Signalling System 7, or SS7.<sup>5</sup>

45. The SS7 signaling protocol has been used since well before June 1999. It was first issued by CCITT (for Comité Consultatif International Téléphonique et Télégraphique, now known as the ITU-T for Telecommunication Standardization Sector of the International telecommunications Union, the primary

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<sup>5</sup> Ex. 1017.

{38560571;1}

international body for cooperative telecommunications standards) in 1980, and was revised in 1984, 1988, and 1992.

**C. Packet-Switching Networks: the Internet and Voice over IP**

46. Websites on the Internet were well known even to the general public by June 1, 1999. As noted above, by June of 1999, there were over 3 million websites on the web, including Yahoo, Amazon, and eBay. Leiner *et al.* explain in the February 1997 issue of Communications of the ACM that by early 1997, the Internet was already well established as a commercial platform:

In the last few years, we have seen a new phase of commercialization. Originally, commercial efforts mainly comprised vendors providing the basic networking products and service providers offering connectivity and basic Internet services. *The Internet has now become almost a “commodity” service, and much of the latest attention has been on the use of this global information infrastructure as support for other commercial services.*

This activity has been accelerated by the widespread and rapid adoption of browsers and Web technology, giving users easy access to information linked around the globe. Products are

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