EXHIBIT 1
PART B

On-network and Off-network Calls

[0243] All direct or indirect SIP call sessions that occur between endpoints that lie within the ESN (i.e. entirely within the IP CARRIER NETWORK [6]), end-to-end, are termed "on-network" calls. An "off-network" call occurs whenever one end of a call session is an endpoint that lies outside of the IP CARRIER NETWORK [6] (such as the PSTN [7]), regardless of which endpoint originated the call.

[0244] Off-network calls to the PSTN [7] utilize a PTSN GATEWAY [8] to complete the call path for both signaling and bearer connections. Because the PSTN GATEWAY [8] is a shared resource, potentially located only in selected network segments and accessed by many network users at the same time, it requires some degree of expanded access control. The carrier may wish to partition the IP CARRIER NETWORK [6] with respect to PSTN GATEWAY [8] access, perhaps for the purposes of load balancing and ensuring redundancy. The PSTN GATEWAY [8] will require assistance in routing calls inbound from the PSTN [7] to specific IP CARRIER NETWORK [6] endpoints. For all these purposes, a SIP PROXY SERVER [12] is most often used as an intermediary; thus as a practical matter, an off-network call is virtually always an indirect call. An example of an off-network call is depicted in FIG. 10 where the EDGE SWITCH [1] labeled A connects to a PSTN [7] endpoint through the PSTN GATEWAY [8], as indicated by {10} and {11}.

Distributed Edge Switch Network Service Delivery Workflow

[0245] FIG. 12 depicts selected elements of the DES carrier network reference architecture for the purpose of illustrating DES network service delivery workflow sequences. According to the DES network service delivery model, services internal to the EDGE SWITCH [1] and those residing in the network are combined into more comprehensive network services based on the subscriber's Class of Service. Almost every network service provided by the EDGE SWITCH [1] is derived from, initiated by, or built on top of EDGE SWITCH BASIC FEATURES [1.24]. EDGE SWITCH BASIC FEATURES [1.24] render TELEPHONE STATION FEATURES and SET-TOP BOX FEATURES to subscribers through TELEPHONE STATIONS [3] and SET-TOP BOXES [4] respectively, as indicated by {1}.

[0246] Any call originated or received by a terminal plugged into the EDGE SWITCH [1] will the trigger the execution of particular service logic (i.e. CALL PROCESSING APPLICATIONS [1.23.2]). The execution of which particular service logic depends upon the subscriber's Class of Service capabilities, settings, and preferences; some settings will change the logic to a completely different type of service logic altogether whereas other settings may simply alter some aspect of the service logic. In some cases, the service logic of EDGE SWITCH BASIC FEATURES [1.24], such as "call-forwarding" for example, may as a matter of course redirect calls to NETWORK-BASED ENHANCED SERVICES [18]. NETWORK-BASED ENHANCED SERVICES [18] may be accessible to the EDGE SWITCH [1] as network signaling endpoints residing in either the PSTN [7], as indicated by {4}, or the IP CARRIER NETWORK [6], as indicated by {5}.

[0247] An ready example of {5} exists in a popular network service called "voice call-answering." To implement voice call-answering, A conditional call-forwarding feature (EDGE SWITCH BASIC FEATURE [1.24]) is programmed to forward a call to a voice call-answering application (NETWORK-BASED ENHANCED SERVICE [18]) if the TELEPHONE STATION [3] rings three times without being answered or is busy.

[0248] An EDGE SWITCH BASIC FEATURE [1.24] may be substituted with EDGE SWITCH OVERRIDE FEATURE [1.25] that either (a) adds functionality to on top of it, as indicated by {3} or (b) provides an alternative implementation of it, as indicted by {2}.

[0249] To provide an example of {3} (i.e. adds functionality to EDGE SWITCH BASIC FEATURE [1.24]) the previous example of voice call-answering can be expanded to offer a Class of Service setting that would send an instant message to inform the subscriber that they were receiving a voice message. In this case, a simple instant messaging client in the EDGE SWITCH [1] would perform the messaging operation after the caller was forwarded to the voice call-answering application. The original functionality of basic call-answering remains unchanged.

[0250] To provide an example of {2} (i.e. provides an alternative implementation of an EDGE SWITCH BASIC FEATURE [1.24]) the basic call-forwarding function could be replaced completely with a more advanced version that maintained a "do-not-disturb" function based on time of day. At certain times of the day (as programmed by the subscriber) all callers would be automatically transferred to the voice call-answering application and the telephone would not ring. The original functionality of basic call-answering is changed to alter its behavior based on the time of day.

[0251] In some cases, the desired EDGE SWITCH OVERRIDE FEATURE [1.25] is too complex for the EDGE SWITCH [1] to implement internally. As indicated by {6}, the EDGE SWITCH BASIC FEATURE [1.24] is replaced with a NETWORK-BASED OVERRIDE FEATURE [19]. An example of {6} would be a "contact dialing" feature in which the standard dial-tone provided as an EDGE SWITCH BASIC FEATURES [1.24] is completely replaced with replaced with a NETWORK-BASED OVERRIDE FEATURE [19] that supports multiple dialing modalities depending on subscriber whim. The new dial-tone feature would interoperate with the subscribers contact list, enabling them to "click to dial" from the COMPUTER WORKSTATION [5] desktop, or simply speak the name of the contact they wish to dial, or allow them to dial the telephone in the usual manner.

Preferred Embodiment of Edge Switch

[0252] FIG. 13 depicts a preferred embodiment for the DES. A version of the EDGE SWITCH [1] has been constructed for residential subscriber deployment using a Very-high-data-rate Digital Subscriber Line (VDSL) interface to the BROADBAND ACCESS NETWORK [6.1]. VDSL bit transfer rates vary according to cable length and by manufacturer. VDSL chip-sets currently available support downstream bit transfer rates over 25 megabits/second for cable lengths in excess of 3,500 feet. Upstream bit transfer rates are typically lower than downstream rates.

Edge Switch Physical Form Factor

[0253] The EDGE SWITCH [1] supports four individual POTS lines and four SET-TOP BOXES [4] using an ETHERNET SWITCH [20] plugged into the VIDEO STREAMING DEVICE INTERFACE [1.5]. 10Base-T ethernet technology is used for the cable connections. An ETHERNET HUB [9] plugged into the COMPUTER DATA INTERFACE [1.4] also uses 10Base-T ethernet technology. The ETHERNET HUB [9] enables four COMPUTER WORKSTATIONS [5] to share a single data service.

[0254] The EDGE SWITCH [1] is deployed on the network-side of the SUBSCRIBER NETWORK INTERFACE [21] at the Telco Entrance Facility where the inside wiring is accessible through a POTS channel bank mounted on the outside of the subscriber premise. It is powered by current from the copper wire plant supporting the VDSL broadband network service.

[0255] EDGE SWITCH [1] electronics and connectors are contained within an environmentally protected plastic housing that incorporates a hinged cover panel used to provide service access. The physical dimensions of the plastic housing mirror the form factor of the Telco Entrance Facility (10" heightx9" widthx3" depth). Using the existing Telco Entrance Facility (originally used for POTS service), the EDGE SWITCH [1] gains the electrical and environment protection provided for the existing entrance device; additional protection capabilities within the housing are incorporated in the design to further protect the electronic components.

Bandwidth Utilization

[0256] Each of the four POTS interfaces support three-way calling features accessible to the TELEPHONE STATIONS [3]. Internally, they support four-way calling so as to enable an additional call leg in a three-way call as would occur if the call was to be intercepted for law enforcement assistance. Voice communications nominally utilize the G.729a codec (vocoder type), which consumes 8 kilobytes/second per voice bearer channel (media stream) connection. With four simultaneous POTS sessions, each involved in three-way intercepted call, the total bandwidth consumed for voice transmission is approximately 100 kilobits/second (not including signaling and packetization overhead). In the event that the EDGE SWITCH [1] detects modem tones on a line, such as from a fax machine, it will automatically change the codec from G.729 a to G.711 so as to enable modem-based data communications over the voice bearer channel.

[0257] A high-quality video stream consumes approximately 3.5 megabits/second; thus total bandwidth for four simultaneous video (multimedia) is approximately 14 megabits/second. Taking these estimates into consideration, the maximum bandwidth that could be consumed by EDGE SWITCH [1] voice and multimedia sessions is approximately 15 megabits/second. Assuming a VDSL broadband capable of supporting 20 megabits/second, at least 5 megabits/second would be available for data communications by the COMPUTER WORKSTATIONS [5].

Operational Capacity

[0258] The EDGE SWITCH [1] supports EDGE SWITCH BASIC FEATURES [1.24] for TELEPHONE STATIONS [1], SET-TOP BOXES [4] and COMPUTER WORKSTATIONS [5]. Two default CONFIGURATION PROFILES [5] are pre-programmed into the EDGE SWITCH [1] so as to enable TELEPHONE STATION FEATURES and SET-TOP BOX FEATURES to operate as follows:

[0259] A default terminal function key profile is configured so as to enable subscribers to access TELEPHONE STATION FEATURES by entering DTMF digit sequences through the TELEPHONE STATIONS [3]. TELEPHONE STATION [3] speed-dial keys may be programmed to support these DTMF digit sequences so that they can be used as dedicated feature keys.

[0260] A default SET-TOP BOX [4] interface profile is programmed into the EDGE SWITCH for the particular type of SET-TOP BOX [4] at the subscriber premise. This interface profile is used internally by the EDGE SWITCH [1] to convert the vendor-specific command sequences supported by the SET-TOP BOX [4] to be compatible with the channel selection protocol supported by the NETWORK-BASED ENHANCED SERVICES [18] providing selectable video content;

DEFINITIONS

[0261] This section contains definitions for major system elements, terms, and protocols referenced in this disclosure. The telecommunications industry contains a variety of views regarding exactly what comprises these elements; thus the definitions should not in all cases be considered absolute. Definitions annotated with numerical identifiers in brackets refer to system elements that are explicitly shown in figures.

IETF

[0262] Internet Engineering Task Force (IETF). The IETF is a standards body whose conventions mandate that a body of work is presented initially as an "Internet Draft" which either expires or is formally promulgated to a "Request for Comment" (RFC). Both the Internet Draft and RFC documents must comply with a content format convention.

ITU-T

[0263] International Telecommunications Union—Telephony (ITU-T).

POTS

[0264] Plain Old Telephone Service. Standard analog telephone service provided by the PSTN. POTS relies upon a CENTRAL OFFICE SWITCH line card containing a Subscriber Line Interface Circuit (SLIC). For more information, see the definition for the TELEPHONE LINE INTERFACE [1.9] below.

EDGE SWITCH [1]

[0265] DES system element that is a hardware device used to terminate IP-based voice, video, and data broadband network service at the network subscriber (customer) premise. It is deployed as a premise-based network element at the carrier point of demarcation where outside wiring connects to inside wiring, and functions as an integral service delivery component of the IP CARRIER NETWORK [6]. EDGE SWITCHES are constructed according

to a variety of form-factors as required to accommodate voice, video, and data termination requirements at the subscriber premise.

[0266] Regardless of form-factor, all EDGE SWITCHES are centrally managed by a SYSTEM MANAGEMENT PLATFORM [2], which is installed in the central office or central office equivalent. When the EDGE SWITCH is connected to the BROADBAND ACCESS NETWORK [6.1], it registers with a default SYSTEM MANAGEMENT PLATFORM [2]. At that time, the SYSTEM MANAGEMENT PLATFORM [2] remotely loads the EDGE SWITCH with all the software necessary for it to deliver the network services (service capabilities) purchased by the subscriber at whose premise the EDGE SWITCH has been installed. Once the EDGE SWITCH completes its system startup procedure with the new software load, the subscriber may then configure the EDGE SWITCH according to their personal preferences through a web user interface. A web application running on a WEB SERVER [11] initiates an authenticated (secure) login to the EDGE SWITCH and thereby mediates subscriber access to its features.

[0267] Architecturally, the EDGE SWITCH has two distinct "sides:" the network side and the subscriber side. The network side of the EDGE SWITCH incorporates a BROADBAND NETWORK INTERFACE [1.1] that physically connects it to the BROADBAND ACCESS NETWORK [6.1]; it provides all necessary electrical (and potentially optical) signal modulation and network adaptation necessary to terminate broadband network access. The network side ultimately presents the IP ROUTING MODULE [1.2] in the EDGE SWITCH with an IP access path through the BROADBAND ACCESS NETWORK [6.1], dynamically aggregating voice-over-IP, video-over-IP, and common data-over-IP packet flows into a composite IP packet flow. The total bitrate transmission requirements for this composite IP packet flow must be less than or equal to the total available through the BROADBAND NETWORK INTERFACE [1.1]. Central to its ability to support multi-service delivery through the BROADBAND NETWORK INTERFACE [1.1], the EDGE SWITCH supports internal service logic that determines if the projected composite IP packet flow that would be required to support the delivery of all requested voice, video, and data services would exceed the total bitrate transmission available from the network side.

[0268] The subscriber side of the EDGE SWITCH connects to TELEPHONE STATIONS [3], SET-TOP BOXES [4], and COMPUTER WORKSTATIONS [5] installed at the subscriber premise. It provides telephone services to the TELEPHONE STATIONS [3], video (multimedia) services to the SET-TOP BOXES [4], and data communication services to the COMPUTER WORKSTATIONS [5]. In the case of TELEPHONE STATIONS [3], the EDGE SWITCH converts analog electrical (and potentially digital) telephone device-level signaling and voice transmission conventions to and from IP packets containing SIP network signaling information and digitally-encoded voice. In the case of SET-TOP BOXES [4], it is assumed that device signaling information and media content are already digitally-encoded in IP packets and that SET-TOP BOXES [4] natively support SIP network signaling. The subscriber side supports admission control features that enable it to deny voice and/or video calling service delivery to TELEPHONE STATIONS [3] or SET-TOP BOXES, or attenuate data service delivery to COMPUTER WORKSTATIONS [5].

[0269] Support for voice-over-IP or video-over-IP call sessions on the subscriber side requires that the EDGE SWITCH perform a prioritized IP routing function to ensure the timely transport of IP packet flows bi-directionally between the TELEPHONE STATIONS [3] (and SET-TOP BOXES [4]) and the IP CARRIER NETWORK [6]. As TELEPHONE STATIONS [3] (and SET-TOP BOXES [4]) answer incoming SIP call sessions or originate outgoing SIP call sessions, the EDGE SWITCH dynamically reserves the requisite network side bandwidth on demand—effectively removing it from the pool of bandwidth available to COMPUTER WORKSTATIONS [5]—and discretely reassigns it to media transmission. IP packets needed for real-time voice and streaming video transmission are isolated into labeled IP packet flows. The labeled voice and video packet flows are then routed by the IP ROUTING MODULE [1.2] through the BROADBAND ACCESS NETWORK [6.1] at a higher priority than common data packets, thus enabling them to be routed preferentially through other elements of the IP CARRIER NETWORK [6], according to a higher quality of service than necessary to support common data transmission.

[0270] TELEPHONE STATIONS [3] and SET-TOP BOXES [4] plugged into the subscriber side of the EDGE SWITCH may to a certain extent be vendor-specific in the way they communicate with it. For the purpose of normalizing the way that end-users may access network services using different brands of TELEPHONE STATIONS [3] and SET-TOP BOXES [4], the EDGE SWITCH supports terminal adaptation features, performing device signaling and media format conversion bi-directionally in real-time as required to interoperate with SIP endpoints residing within the IP CARRIER NETWORK [6].

[0271] TELEPHONE STATIONS [3] also tend to differ from vendor to vendor in their function key layouts. For example, a telephone key dedicated to deleting a voice message will generate a tone sequence or key code that may not match the tone sequence or key code utilized by a particular vendor's voice messaging system for the same function. Telephone function key layout profiles can be programmed into the EDGE SWITCH by the subscriber (mediated through a network-based web server) so that the EDGE SWITCH can convert a vendor-specific tone sequence or key code used by a particular TELEPHONE STATION [3] to a user interface convention that can be understood by NETWORK-BASED ENHANCED SERVICES [18].

[0272] Although the SET-TOP BOXES [4] natively support SIP network signaling and communicate through an IP connection, the EDGE SWITCH may still be required to convert vendor-specific device signaling information (e.g. protocols for channel selection) to be compatible with conventions used by NETWORK-BASED ENHANCED SERVICES [18] providing video streaming content.

[0273] The EDGE SWITCH has sufficient storage and processing capabilities to implement an optimized subset of subscriber telephone features and services that are today provided by the CENTRAL OFFICE SWITCH [7.1], including certain Customer Local Access Signaling Services (CLASS) and selected PBX/Centrex features usually pro-

vided to businesses. Telephone services and features are provided by each EDGE SWITCH to the TELEPHONE STATIONS [3] plugged into it without any requirement to interface a CENTRAL OFFICE SWITCH [7.1], and without any requirement to interface network elements such as "IP Centrex" feature servers. Inasmuch as telephone features are implemented internally by the EDGE SWITCH, so too is the ability to generate and internally store event histories for subscriber access to these services. The internally stored event histories are sorted by the EDGE SWITCH such that billable events may be periodically transmitted to a SYSTEM MANAGEMEMENT PLATFORM [2] for further processing. The SYSTEM MANAGEMEMENT PLATFORM [2] positively identifies the end user that generated the billable events by matching the physical device address of the EDGE SWITCH that generated the billable events with the physical device address of an EDGE SWITCH registered to an end user.

[0274] Private dialing plans may be cached in the EDGE SWITCH, as are subscriber preferences and related configuration data necessary to support telephone feature delivery. A single EDGE SWITCH can internally store over a year of call log data, and make that information available to a third-party application; thus the EDGE SWITCHES deployed in the network collectively function as a distributed subscriber call log data base that scales with the network and is capable of real-time access by network applications. An EDGE SWITCH can make its feature delivery and call control capabilities available to a third-party application; thus the EDGE SWITCHES deployed in the network collectively function as a distributed call control and feature delivery resource that scales with the network and is capable of (near) real-time access by network applications. The capability of EDGE SWITCHES to make subscriber-specific information (call log and Class of Service data) and calling feature delivery remotely accessible to third-party applications enables new types of interactive calling services in which subscribers may actively participate in network service delivery by the EDGE SWITCHES.

[0275] Making the most intelligent use of policy data and subscriber preferences cached within it, the EDGE SWITCH [1] attempts to connect telephone calls and deliver telephone features in the most localized manner possible with minimal assistance from carrier network elements. The EDGE SWITCH [1] supports SIP network signaling natively and incorporates its own internal call routing functionality, making it possible for telephone calls between TELEPHONE STATIONS [3] plugged into the same EDGE SWITCH to be routed internally through its IP ROUTING MODULE [1.2] or potentially through its MEDIA STREAM CONTROLLER [1.7]. As a result, these "on-switch" call sessions do not require network resources to support end-to-end signaling, media transmission, or telephone device control, and thus are not significant consumers of network transmission resources.

[0276] For telephone calls between TELEPHONE STATIONS [3] that are not plugged into the same EDGE SWITCH, the call paths are established as SIP call sessions through the IP CARRIER NETWORK [6], between EDGE SWITCHES [1]. This mode of communication is possible because each EDGE SWITCH [1] presents the TELEPHONE STATIONS [3] (and SET-TOP BOXES [4]) to the IP CARRIER NETWORK [6] as an array of intelligent SIP endpoints.

BROADBAND NETWORK INTERFACE [1.1]

[0277] Hardware subcomponent of the EDGE SWITCH [1] that physically connects it to the BROADBAND ACCESS NETWORK [6.1] using any one of number of OSI Layer 1 broadband technologies (e.g. coaxial cable, Ethernet cable, optical coupling, or copper wire) as required by the host carrier. This subcomponent provides IP connectivity from OSI Layer 3 (network layer) down, which includes OSI Layer 2 (data link layer) and OSI Layer 1 (physical layer). While the BROADBAND NETWORK INTERFACE may be implemented using any type of OSI Layer 2 and OSI Layer 1 technology, it is required to aggregate all available broadband network transmission capacity into to single IP data service in OSI Layer 3, and then to present an interface to that data service to the IP ROUTING MODULE [1.2]. It is anticipated that in some implementations, the BROADBAND NETWORK INTERFACE may be support programmable logic that would enable it to be customized or upgraded, potentially remotely by the SYSTEM MANAGEMENT PLATFORM [2].

IP ROUTING MODULE [1.2]

[0278] Hardware subcomponent of the EDGE SWITCH [1] that performs all IP (OSI Layer 3) packet routing functions. It communicates with the BROADBAND ACCESS NETWORK [6.1] through the BROADBAND NETWORK INTERFACE [1.1]. It provides IP-based video stream connectivity for SET-TOP BOXES [4] through the VIDEO EXTENDER MODULE INTERFACE [1.4] and provides IP data connectivity to COMPUTER WORKSTATIONS [5] through the COMPUTER DATA INTERFACE [1.5]. It provides voice stream connectivity for TELEPHONE STATIONS [3] through its integration with the MEDIA STREAM CONTROLLER [1.7] and PACKETIZATION COPROCESSOR [1.6].

[0279] This subcomponent enforces preferential routing policies to ensure higher priority voice and video packets are routed in a timely fashion. The IP ROUTING MODULE prioritizes packets for routing based upon a labeling mechanism that assigns them to predefined QoS standards. Higher priority packets are classified and scheduled for processing ahead of lower priority packets. The IP ROUTING MODULE supports transmission pathways in which both connection endpoints correspond to voice or video terminals plugged into the same EDGE SWITCH [1], and supports a programmatic interface such that it may be directly controlled by software in the IP ROUTING SYSTEM [1.4].

POWER SUPPLY [1.3]

[0280] Hardware subcomponent of the EDGE SWITCH [1] that conditions power from a DC POWER SOURCE [6.2] prior to making it available to the electronic components of the EDGE SWITCH [1]. This subcomponent provides for surge protection and may be implemented with battery functionality so that it is able to continue powering the EDGE SWITCH [1] for a period of time after the DC POWER SOURCE [6.2] has failed. The POWER SUPPLY [1.3] may be implemented with a switch that enables it to be

switched between line power (from the BROADBAND ACCESS NETWORK [6.1] physical connection) or from a premise-based power source.

COMPUTER DATA INTERFACE [1.4]

[0281] Hardware subcomponent of the EDGE SWITCH [1] integrated with external cabling interface used to plug in one or more COMPUTER WORKSTATIONS [5] to the EDGE SWITCH [1]. The COMPUTER DATA INTERFACE supports bidirectional IP data paths used for common data transport between the IP ROUTING MODULE [1.2] and the COMPUTER WORKSTATIONS [5]. If more than one COMPUTER WORKSTATION [5] is used, an ETHERNET HUB [9] or ETHERNET SWITCH [20] may be used for the purpose of distributing data streams to more than one COMPUTER WORKSTATION [5] at the same time.

VIDEO STREAMING DEVICE INTERFACE [1.5]

[0282] Hardware subcomponent of the EDGE SWITCH [1] integrated with external cabling interface that is used to connect SIP video streaming devices such as SET-TOP BOXES [4]. SIP media streaming devices natively support SIP network signaling. The VIDEO STREAMING DEVICE INTERFACE supports bidirectional IP data paths used for SIP network signaling and real-time media streaming between the IP ROUTING MODULE [1.2] and one or more SET-TOP BOXES [4]. If more than one SET-TOP BOX [4] is plugged into the EDGE SWITCH [1], an ETHERNET SWITCH [20] should be used so as to ensure sufficient bandwidth necessary to maintain network quality of service for all video call sessions.

PACKETIZATION COPROCESSOR [1.6]

[0283] Hardware subcomponent of the EDGE SWITCH [1] that is used by the MEDIA STREAM CONTROLLER [1.7] to assist in real-time processing of voice media and voice-related IP data packets transmitted through the IP ROUTING MODULE [1.2]. Most packet processing carried out by the PACKETIZATION COPROCESSOR [1.6] is in support of IETF RFC 1889 on RTP: A Transport Protocol for Real-Time Applications, and IEFT RFC 2833 on RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals. The PACKETIZATION COPROCESSOR may also be used for packet labeling to mark voice-related IP data packets originating at the TELEPHONE LINE INTERFACE [1.9] with the appropriate quality of service marker prior to their introduction to the IP ROUTING MODULE [1.2]. While some implementations may choose to implement voice encoding and decoding algorithms on the DIGITAL SIGNAL PROCESSOR [1.8], it is also possible that the PACKETIZATION COPROCESSOR [1.6] could be used for this purpose.

MEDIA STREAM CONTROLLER [1.7]

[0284] Hardware subcomponent of the EDGE SWITCH [1] used to interconnect, mix, and process full and half-duplex media streams. For a media stream to be interconnected, mixed, or processed by the MEDIA STREAM CONTROLLER, at least one of its endpoints must terminate on it, whereas the other endpoint of that media stream may terminate either on the TELEPHONE LINE INTERFACE [1.9] or within the IP CARRIER NETWORK [6] (transmitted through the BROADBAND NETWORK INTERFACE [1.1]).

[0285] The MEDIA STREAM CONTROLLER can be used to interconnect two media streams to create a full or half-duplex media session. It can interconnect three or more media streams to create a fully meshed conference. The MEDIA STREAM CONTROLLER enables multi-party conference calls of this type through the use of conferencing resources. All media streams that are interconnected through a conferencing resource will receive the media contents of all other media streams connected to that conferencing resource. Media transmission to or from any media stream endpoint can be enabled or disabled, and signal processing algorithms may be applied to any stream.

[0286] The MEDIA STREAM CONTROLLER physically interfaces the IP ROUTING MODULE [1.2] on the network side of the EDGE SWITCH [1] and the TELEPHONE LINE INTERFACE [1.9] on the subscriber side. In order to more efficiently transmit voice in real-time through the BROADBAND ACCESS NETWORK [6.1] (according to IETF RTP protocol standards), the MEDIA STREAM CONTROLLER [1.7] uses the PACKETIZATION COPROCESSOR [1.6] as a dedicated peripheral computing resource for packet processing. In like fashion, the MEDIA STREAM CONTROLLER [1.7] uses the DIGITAL SIGNAL PROCESSOR [1.8] as a dedicated peripheral computing resource to run digital signal processing algorithms that may be applied dynamically to media streams as needed.

DIGITAL SIGNAL PROCESSOR [1.8]

[0287] Hardware subcomponent of the EDGE SWITCH [1] that is a dedicated peripheral computing resource used to provide signal processing functions to the MEDIA STREAM CONTROLLER [1]. It may be implemented as an independent device or its capabilities may be integrated directly into the MEDIA STREAM CONTROLLER [1.7]. This subcomponent supports running various digital signal processing algorithms that may include DTMF digit detection, DTMF digit generation, network tone detection, network tone generation, noise cancellation, comfort noise generation, echo cancellation, voice onset detection, voice offset detection, modem (fax) tone detection, and media stream encoding/decoding/transcoding.

TELEPHONE LINE INTERFACE [1.9]

[0288] Hardware subcomponent of the EDGE SWITCH [1] integrated with external cabling interface that is used to connect TELEPHONE STATIONS [3]. TELEPHONE STATIONS [3] do not natively support SIP network signaling and as a result cannot present themselves to an IP network as SIP network signaling endpoints without assistance from the EDGE SWITCH [1].

[0289] The TELEPHONE LINE INTERFACE may also be adapted to support a variety of proprietary telephones, such analog POTS telephones, digital PBX telephones and various Centrex telephones.

[0290] If used to connect POTS telephones, the TELEPHONE LINE INTERFACE supports many of the BORSCHT functions, including: (B) Battery feed to power the subscriber's telephone, (R) Ringing signal to the subscribers

telephone, (S) Supervision to detect caller off-book, calls in progress, calls terminated, (C) Coding of analog voice signals into PCM digital format, (H) Hybrid transformer for conversion from two-wire to four-wire, and filtering to provide impedance match to remove or minimize echoes, and (T) Testing of the local loop and circuits of the switching equipment to detect faults and provide maintenance. Each POTS service interface provided by the TELEPHONE LINE INTERFACE [1.9] is a basic two-wire "Tip and Ring" interface that is translated into the four-wire (balanced pair) at the point where it interfaces the MEDIA STREAM CONTROLLER [1.7].

CENTRAL PROCESSING UNIT [1.10]

[0291] Hardware subsystem of the EDGE SWITCH [1] consisting of various subcomponents that include a main processor, peripheral controllers and memory cache devices necessary for it to function as a stand-alone computer running a real-time, preemptive, multi-tasking operating system. The CENTRAL PROCESSING UNIT provides supervisory control, directly or indirectly, for all EDGE SWITCH [1] features and functions. It interfaces RANDOM ACCESS MEMORY [1.11], utilizing it to provide memory needed to run the operating system and various application programs; it interfaces NON-VOLATILE MEMORY [1.11], utilizing it to store vital system configuration parameters and as a FILE SYSTEM [1.23]; it interfaces both the MEDIA STREAM CONTROLLER [1.7] and the IP ROUTING MODULE [1.2] through a system bus or similar means, utilizing each as a dedicated peripheral computing resource (under software control) to implement media connectivity and IP routing operations respectively.

RANDOM ACCESS MEMORY [1.11]

[0292] Hardware subsystem of the EDGE SWITCH [1] consisting of any array of solid-state storage devices configured to provide randomly addressable memory directly accessible to the CENTRAL PROCESSING UNIT [1.10]. The storage devices that comprise this subsystem provide volatile memory whose contents are considered to be undefined after a system reset cycle and must be initialized prior to use.

NON-VOLATILE MEMORY [1.12]

[0293] Hardware subsystem of the EDGE SWITCH [1] consisting of any array of solid-state storage devices configured to provide block addressable memory accessible to the CENTRAL PROCESSING UNIT [1.10] using direct memory access (DMA) or equivalent means. The storage devices that comprise this subsystem user non-volatile memory whose contents are retained between system reset cycles.

NETWORK ADAPTATION LAYER [1.13]

[0294] EDGE SWITCH [1] subsystem comprised of software, firmware, or other programmable logic (or combination thereof) that is used to control or impart functionality into the BROADBAND NETWORK INTERFACE [1.1]. This programmable subsystem makes it possible for the EDGE SWITCH [1] to adapt to a variety of OSI Layer 1 and 2 technologies supported by the BROADBAND ACCESS NETWORK [6.1]. The NETWORK ADAPTATION LAYER provides all of the control logic necessary to enable the BROADBAND NETWORK INTERFACE [1.1] to aggregate all available broadband network transmission capacity into to single IP data service in OSI Layer 3, and then to present an interface to that data service to the IP ROUTING MODULE [1.2].

IP ROUTING SYSTEM [1.14]

[0295] Software subsystem of the EDGE SWITCH [1] consisting of software components and related applications necessary to control the IP ROUTING MODULE [1.2]; this software subsystem incorporates an IP protocol stack and implements IP routing services necessary to support voice, video, and data communications through the IP CARRIER NETWORK [6]. Software modules within the IP ROUTING SYSTEM support a programmable firewall, Network Address Translation (NAT), Dynamic Host Configuration Protocol (DHCP), and Virtual Private (data) Networking (VPN).

[0296] The IP ROUTING SYSTEM may utilize the FILE SYSTEM [1.23] to store routing tables. It will support IPv6 (the current build to standard). IPv6 provides both enhanced addressing capabilities as well as support for the quality of service capabilities previously only found in ATM implementations. Thus, by supporting IPv6, the IP ROUTING SYSTEM may employ open shortest path first (OSPF) routing to request a path to the desired endpoint for voice, video, and data packet transmission.

RTP PROTOCOL STACK [1.15]

[0297] Software subcomponent in the EDGE SWITCH [1] that implements support for IETF RFC 1889 on RTP: A Transport Protocol for Real-Time Applications (RTP), and its adjunct protocol IETF RFC 2833 on RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals. Most or all of the RTP PROTOCOL STACK software may run on the PACKETIZATION COPROCESSOR [1.6]. RTP is the media transmission protocol used by the DES to transmit all real-time voice and video media streams through the IP CARRIER NETWORK [6].

[0298] RFC 2833 describes a means by which DTMF digits, telephone tones, and telephony signals are transmitted "out of band" by encoding them as numerical codes that are inserted into special-purpose RTP packets. RFC 2833 is used when a selected voice media stream encoding format is likely to render these DTMF digits, telephone tones, and telephony signals unintelligible to digital signal processors when the media stream is decoded at the receiving end of the session.

[0299] The RTP PROTOCOL STACK is utilized by the ABSTRACT TELEPHONE CONTROLLER [1.19] as a means to establish real-time media stream sessions (i.e. bearer channel connections) between SIP network signaling endpoints within the IP CARRIER NETWORK [6]. RTP sessions maintained by the RTP PROTOCOL STACK are physically associated with media stream endpoints on the MEDIA STREAM CONTROLLER [1.7] under the control of the ABSTRACT TELEPHONE CONTROLLER [1.19]. The RTP PROTOCOL STACK uses the data communication services of the IP ROUTING SYSTEM [1.14] to support IP-based media transmission between a media stream endpoint (i.e. port) on the MEDIA STREAM CONTROLLER [1.7] and a media stream endpoint in the IP CARRIER

NETWORK [6] (or potentially with another media stream endpoint also on the MEDIA STREAM CONTROLLER [1.7] in the case of a call session that is internal to the EDGE SWITCH [1]).

SIP PROTOCOL STACK [1.16]

[0300] Software subcomponent in the EDGE SWITCH [1] that implements support for the "SIP Proxy Server" functionality described further in this disclosure (see SIP PROXY SERVER [12]) and to IETF RFC 2543 on SIP: Session Initiation Protocol (SIP). The SIP PROTOCOL STACK also implements support for IETF RFC 2327 on SDP: Session Description Protocol (SDP). SDP is an adjunct protocol to SIP and is used by SIP network signaling endpoints participating in a call session to describe to each other the detailed characteristics of the voice or video media streams (i.e. bearer channels) that they are capable of receiving from each other.

[0301] The EDGE SWITCH [1] represents each TELEPHONE STATION [3] internally as a SIP network signaling endpoint to the IP CARRIER NETWORK [6] by associating it with particular E.164 dialing number that is recognized by the SIP PROTOCOL STACK. The ABSTRACT CALL MODEL [1.20] supports a telephone gateway function in which a SIP User Agent is used to perform SIP network signaling endpoint functions on behalf of each TELEPHONE STATION [3] plugged into the TELEPHONE LINE INTERFACE [1.9]. This SIP User Agent directs its SIP network signaling operations to the SIP PROTOCOL STACK, using it as its default SIP Proxy Server.

[0302] Although a SET-TOP BOX [4] natively supports SIP network signaling and is an actual SIP network signaling endpoint (i.e. contains a SIP User Agent), it exchanges SIP messages through the SIP PROTOCOL STACK on the EDGE SWITCH [1]. The SIP User Agent in the SET-TOP BOX [4] directs its SIP network signaling operations to the SIP PROTOCOL STACK, using it as its default SIP Proxy Server.

[0303] The SIP PROTOOL STACK uses the data communication services of the IP ROUTING SYSTEM [1.14] to support IP-based SIP network signaling operations between itself and the IP CARRIER NETWORK [6].

HTTP PROTOCOL STACK [1.17]

[0304] Software subcomponent in the EDGE SWITCH [1] that implements support for IETF RFC 2068 on Hypertext Transfer Protocol—HTTP Version 1.1 (HTTP). HTTP provides a generalized means for two programs to exchange text and data files over an IP network. The operational semantics of HTTP are based on the notion of a "HTTP client" (we browser) that makes requests for information and an "HTTP server" (web server) that responds to those requests. The HTTP PROTOCOL STACK implements support for both the "HTTP client" and the "HTTP server" elements of HTTP.

[0305] Support for the "HTTP client" element provides a means by which the XML MGMT INTERFACE [1.21] may communicate with the SYSTEM MANAGEMENT PLATFORM [2] (e.g. to report updated subscriber preferences or to upload billing records). Support for the "HTTP server" element makes it possible for any computer implementing the "HTTP client," such as the SYSTEM MANAGEMENT PLATFORM [3] or the WEB SERVER [11], to communicate with the XML MGMT INTERFACE [1.21] for the purposes of system management, service provisioning or subscriber interaction (e.g. to access its features and call log data).

[0306] A computer attempting to communicate with the EDGE SWITCH [1] using HTTP must log-in to the XML MGMT INTERFACE [1.21] and authenticate itself as a valid user. Information exchange and remote activation of EDGE SWITCH [1] features by an external computer is based on XML-encoding (via XML MGMT INTERFACE [1.21]) for both the requests and the responses thereto. The HTTP PROTOOL STACK uses the data communication services of the IP ROUTING SYSTEM [1.14] to support IP-based HTTP sessions between the "HTTP client" and "HTTP server" instances that it maintains internally, and other "HTTP client" and "HTTP server" instances in the IP CARRIER NETWORK [6].

SNMP PROTOCOL STACK [1.18]

[0307] Software subcomponent in the EDGE SWITCH [1] that implements support for IETF RFC 1157 on SNMP: A Simple Network Management Protocol (SNMP). SNMP is a protocol by which management information for a network element may be inspected or altered by remote users. It is used to communicate management information between network management stations and "SNMP agents" (specialized software processes) running on the managed network elements. The SNMP functional paradigm for monitoring and control is designed to be extensible to accommodate additional, possibly unanticipated aspects of network operation and management; thus, the SNMP architecture is adaptable to accommodate the management of EDGE SWITCHES [1] by the SYSTEM MANAGEMENT PLATFORM [2].

[0308] In the DES management paradigm, the SYSTEM MANAGEMENT PLATFORM [2] functions as the primary management station for a select population of EDGE SWITCHES [1]. The SNMP PROTOCOL STACK uses the data communication services of the IP ROUTING SYSTEM [1.14] to support SNMP sessions between the SYSTEM MANAGEMENT PLATFORM [2] and the DEVICE MGMT AGENTS [1.22].

ABSTRACT TELEPHONE CONTROLLER [1.19]

[0309] Software subcomponent of the EDGE SWITCH [1] that logically defines a full-featured, abstract telephone device control model that enables a higher-level application program to programmatically control the operation of TELEPHONE STATIONS [3] plugged into the TELEPHONE LINE INTERFACE [1.9], including the ability to interconnect, mix, and process full and half-duplex media streams associated with them. It implements features of this abstract telephone device control model to the fullest extent possible by invoking the MEDIA STREAM CONTROLLER [1.7] as a media control resource and the TELEPHONE LINE INTERFACE [1.9] as a telephone control resource. Certain features such as tone detection, tone generation and media transcoding are supported by the MEDIA STREAM CONTROLLER [1.8] working in conjunction with the DIGITAL SIGNAL PROCESSOR [1.8].

[0310] There is no concept of a "call session" in this telephone control model since only telephone features and media streams are managed. The "call session" concept is maintained in the ABSTRACT CALL MODEL [1.20], which functions as the "higher-level application program"—an application with knowledge of all SIP network signaling endpoints involved in a given call session.

[0311] The telephone control features support enabling or disabling detection of telephone events originating from the TELEPHONE LINE INTERFACE [1.9] (e.g. detection of on-hook, off-hook, hook flash, feature keys, and calls in progress, etc.). Telephone control features also support various device-level telephone features such as activating standard ring signaling, enabling distinctive ringing, enabling or disabling stutter dial-tone, activating or deactivating the message-waiting indicator lamp or to display text on a telephone LCD screen.

[0312] The media stream control features of the ABSTRACT TELEPHONE CONTROLLER support programmatically enabling or disabling media transmission to or from any media stream endpoint, particularly with respect to media stream endpoints associated with TELEPHONE STATIONS [3] plugged into the TELEPHONE LINE INTERFACE [1.9]. Conferencing features enable multi-party calls (e.g. 3-way calling, n-way calling) through the use of conferencing resources that can be applied programmatically. Digital signal processing algorithms may be applied programmatically to any stream to support tone detection, tone generation, echo cancellation and media transcoding, for example.

[0313] The media stream control model used by the ABSTRACT TELEPHONE CONTROLLER reflects that of the underlying MEDIA STREAM CONTROLLER [1.7] used to realize its features. In some respects, the control model is similar to that used by time division multiplex (TDM) telephony devices that support multi-line call and media control interfaces. It assumes that at least one endpoint of a media stream terminates on a MEDIA STREAM CONTROLLER [1.7] port and that the other endpoint of that same media stream terminates either on the TELEPHONE LINE INTERFACE [1.9] or on an endpoint within the IP CARRIER NETWORK [6] (transmitted through the BROADBAND NETWORK INTERFACE [1.1] by the PACKETIZATION COPROCESSOR [1.6] using RTP). This control model also assumes that any two media stream endpoints terminating on MEDIA STREAM CONTROLLER [1.7] ports (regardless of where their other endpoints terminate) may be interconnected through the MEDIA STREAM CONTROLLER [1.7] to create a full or half-duplex media session between the two far-end endpoints.

ABSTRACT CALL MODEL [1.20]

[0314] Software subcomponent of the EDGE SWITCH [1] that logically defines an abstract call control model and adjunct telephone feature set that enables event-driven CALL PROCESSING APPLICATIONS [1.23.2] to deliver network service to subscribers through TELEPHONE STATIONS [3] and SET-TOP BOXES [4] plugged into the EDGE SWITCH [1]. The ABSTRACT CALL MODEL implements its abstract call control model and telephone feature set to the fullest extent possible by (a) invoking network signaling operations available through the SIP PROTOCOL STACK [1.16] and (b) invoking telephone features, media streaming capabilities, and related digital signal processing features available through the ABSTRACT TELEPHONE CONTROLLER [1.19]. By integrating with these software elements, the ABSTRACT CALL MODEL becomes the nexus between the IP CARRIER NETWORK [6] and service logic contained in CALL PROCESSING APPLICATIONS [1.23.2] that are stored within the FILE SYSTEM [1.23].

[0315] CALL PROCESSING APPLICATIONS [1.23.2] define how the EDGE SWITCH [1] responds to certain events—they define the EDGE SWITCH [1] workflow in response to network signaling events and device-level telephone events—and consequently they in effect define the network services that are provided to the subscriber through TELEPHONE STATIONS [3] and SET-TOP BOXES [4].

[0316] The ABSTRACT CALL MODEL supports five distinct functions that are implemented to the fullest extent possible in a device-independent fashion:

[0317] (1) Telephone Gateway Function

[0318] (2) Telephone Feature Delivery Function

[0319] (3) Terminal Adaptation Function

[0320] (4) Calling Service Delivery Function

[0321] (5) Admission Control Function

[0322] The Telephone Gateway Function and the Telephone Feature Delivery Function are only applicable to call sessions involving TELEPHONE STATIONS [3]. Both TELEPHONE STATIONS and SET-TOP BOXES [4] make use of the other three functions. FIG. 7 depicts the EDGE SWITCH [1] call model in some detail, showing specifically how the five ABSTRACT CALL MODEL functions above are implemented within the EDGE SWITCH [1] software architecture.

[0323] For TELEPHONE STATIONS [3] to participate in call sessions using SIP network signaling, the ABSTRACT CALL MODEL [1.20] performs a Telephone Gateway Function in which it actively converts vendor-specific, device-level telephone signaling (through its interface to the ABSTRACT TELEPHONE CONTROLLER [1.19]) into SIP network signaling operations. As depicted in FIG. 7, the ABSTRACT CALL MODEL maintains an instance of a SIP User Agent for each TELEPHONE STATION [3] plugged into the EDGE SWITCH [1]. This SIP User Agent is registered with the SIP PROTOCOL STACK [1.16], using it as its default SIP Proxy Server. The SIP PROTOCOL STACK [1.16] knows which registered SIP User Agent instance corresponds to which dialing number, thus it can direct SIP network signaling to it based on dialing number addressing.

[0324] Certain "TELEPHONE EVENTS" received from the ABSTRACT TELEPHONE CONTROLLER [1.19], and/or SIP network signaling events from the SIP PROTOCOL STACK [1.16], trigger the ABSTRACT CALL MODEL to invoke a CALL PROCESSING APPLICATION [1.23.2] to apply service logic to the call session. This service logic will respond to the received event with some programmed action.

[0325] Since the ABSTRACT CALL MODEL retains device-level control over TELEPHONE STATIONS [3]

plugged into the EDGE SWITCH [1] (through its software integration with the ABSTRACT TELEPHONE CONTROLLER [1.19]) it supports a Telephone Feature Delivery Function in which it may exert device-level control over TELEPHONE STATIONS [3] (see "TELEPHONE CONTROL" in FIG. 7). Commands sent to the ABSTRACT TELEPHONE CONTROLLER [1.19] are ultimately directed to the TELEPHONE LINE INTERFACE [1.9], and in some cases to the actual TELEPHONE STATION [3] itself (e.g. to display text on an LCD screen, activate a message-waiting indication lamp, or to initiate distinctive ring signaling).

[0326] The Terminal Adaptation Function may take place as an adjunct to the Telephone Gateway Function when the ABSTRACT CALL MODEL determines that a CONFIGURATION PROFILE [1.23.5] contains a telephone function key profile that has been programmed into the EDGE SWITCH [1] for a particular type of TELEPHONE STATION [3]. As a result, the ABSTRACT CALL MODEL converts vendor-specific tone sequences or key codes to comply with an appropriate user interface convention (in accordance with model set forth by the function key layout profile).

[0327] As an example of terminal adaptation, a speed-dial feature key on a POTS telephone may be programmed to generate a DTMF tone sequence such as "#45" when pressed. A CONFIGURATION PROFILE [1.23.5] on the EDGE SWITCH [1] contains a telephone function key profile specifying that any time the DTMF digit sequence "#45" is detected from that particular POTS telephone, a virtual function key code called "TRANSER" is generated and passed as a virtual function key event to the CALL PROCESSING APPLICATION [1.23.2] currently executing. Upon receiving the "TRANSFER" virtual function key event, the CALL PROCESSING APPLICATION [1.23.2] will interpret the next series of DTMF digits as the dialing number to which the current call session should be transferred. From the user's perspective, the programmed speed-dial key functions as a dedicated "TRANSFER" key.

[0328] In FIG. 7, two SIP call sessions are shown to illustrate potential SIP protocol message flow. One example shows a SET-TOP BOX [4] (shown as terminal "A") connected in a multimedia SIP call session to another SET-TOP BOX [4] (shown as terminal "C"). Presumably cameras are connected to the SET-TOP BOXES [4] to enable two-way video communications. In a second example, a TELEPHONE STATION [3] (shown as terminal "B") is connected in a voice SIP call session to another TELEPHONE STATION [3] (shown as terminal "D").

[0329] Thus, in summary: terminal A represents a near-end SIP User Agent communicating with terminal C, which represents a far-end SIP User Agent. Terminal B represents a near-end SIP User Agent communicating with terminal D, which represents a far-end SIP User Agent.

[0330] The SET-TOP BOX [4] plugged into the VIDEO STREAMING DEVICE INTERFACE [1.5] (terminal A) and the TELEPHONE STATION [3] plugged into TELEPHONE LINE INTERFACE [1.9] (terminal B)—the near-end SIP User Agents—are both registered with the SIP PROTOCOL STACK [1.16], using it as their default SIP Proxy Server. Thus, the client list for the SIP Proxy Server (i.e. SIP PROTOCOL STACK [1.16]) will treat them both in a consistent fashion as SIP network signaling endpoints representing near-end terminals plugged into the EDGE SWITCH [1].

[0331] The SIP PROTOCOL STACK [1.16], functioning the same as any SIP Proxy Server, will forward SIP protocol messages between the near-end SIP network signaling endpoints (terminals A & B) through the IP CARRIER NETWORK [6] to and from the far-end SIP network signaling endpoints (terminals C & D) to which they are respectively connected. It is the role of a SIP Proxy Server to make network signaling events (shown as "SIGNALING EVENTS") available to an application so that service logic can applied to the SIP call sessions. In the EDGE SWITCH [1] software architecture, the integration between the SIP PROTOCOL STACK [1.16] and the ABSTRACT CALL MODEL [1.20] serves this purpose.

[0332] The Calling Service Delivery Function occurs when the ABSTRACT CALL MODEL, triggered by SIP network signaling events (i.e. SIGNALING EVENTS) from the far-end terminals or near-end terminals, retrieves stored service logic and executes it as a means to participate in the associated SIP call sessions. Service logic for the EDGE SWITCH [1] is contained within CALL PROCESSING APPLICATIONS [1.23.2] stored in the FILE SYSTEM [1.23].

[0333] The ABSTRACT CALL MODEL will recognize certain signaling events (such as an incoming call from the network side) that will trigger it to respond by executing a CALL PROCESSING APPLICATION [1.23.2] that is currently loaded in memory. Or alternately, certain events might trigger the ABSTRACT CALL MODEL to retrieve a new CALL PROCESSING APPLICATION [1.23.2] and execute it anew. Certain CALL PROCESSING APPLICATIONS [1.23.2] will actively query SUBSCRIBER SERVICE PROFILES [1.23.4] to determine the Class of Service for the TELEPHONE STATION [3] involved in the call.

[0334] Ultimately, Calling Services take effect by active participation of CALL PROCESSING APPLICATION [1.23.2] in SIP call sessions; they perform telephone control operations, call control operations and make use of signaling information directly, such as the dialing numbers of the calling and called party.

[0335] The Admission Control Function occurs each time a SET-TOP BOX [4] or TELEPHONE STATION [3] attempts to originate or answer a call. The CALL PROCESSING APPLICATION [1.23.2] contains the service logic used to supervise the connection attempt. This service logic will consider two gating factors that could potentially cause it to deny admission to EDGE SWITCH [1] network services: (a) Class of Service and (b) physical resource availability. The Class of Service assigned to the TELEPHONE STATION [3] or SET-TOP BOX [4] will determine the exact service logic that should be applied to a connection attempt.

[0336] For example, if the Class of Service specifies that outgoing calls to a "900" number from a certain TELEPHONE STATION [3] are not permitted, and a connection attempt to a "900" number is the connection being attempted, then the CALL PROCESSING APPLICATION [1.23.2] will deny it.

[0337] If the service logic allows a connection attempt to proceed on the basis of it complying with the Class of

Service, the CALL PROCESSING APPLICATION [1.23.2] must then determine if sufficient physical resources are available to complete the transaction. Among other considerations, the service logic supported by the CALL PROCESSING APPLICATION [1.23.2] will need to ensure that the new connection will not exceed the maximum number of call sessions supported by the EDGE SWITCH [1] configuration, and that there is adequate network bandwidth, internal routing capability, and digital signal processing resources to support the connection. If all these criteria are met, the connection attempt is allowed to proceed.

[0338] The Terminal Adaptation Function as applied to SET-TOP BOXES [4] may take place as an adjunct to the Calling Service Delivery Function. When the ABSTRACT CALL MODEL determines that one of the CONFIGURATION PROFILES [1.23.5] contains a SET-TOP BOX [4] interface profile that has been programmed into the EDGE SWITCH [1] for a particular type of SET-TOP BOX [4], it will use this profile to convert the vendor-specific command sequences supported by that SET-TOP BOX [4] to comply with an appropriate interface convention.

[0339] Since the SET-TOP BOX [4] interfaces the EDGE SWITCH [1] through an routed IP data path, the ABSTRACT CALL MODEL can only exert device-level control of SET-TOP BOX [4] features indirectly by communicating commands to it through the VIDEO STREAMING DEVICE INTERFACE [1.5]. Commands directed to the SET-TOP BOX [4] may support displaying text over the video image (text overlay) or muting of audio output, for example.

[0340] As a further example of the Terminal Adaptation Function, the SET-TOP BOX [4] at the near-end may use a channel selection protocol incompatible with NETWORK-BASED ENHANCED SERVICES [18] at the far-end used to provide selectable video content; thus the protocol used at the near-end must be converted to an appropriate interface convention used at the far-end.

XML MGMT INTERFACE [1.21]

[0341] XML (extensible Markup Language) is a set of conventions used to create text formats that enable data to be structured as lists of text expressions. The XML MGMT INTERFACE [1.12] is a software subcomponent in the EDGE SWITCH [1] that provides a secure, XML-based data exchange interface for the purposes of (a) enabling a remote user to access information stored in various EDGE SWITCH [1] databases and (b) enabling a remote user to access features and functions supported by the EDGE SWITCH [1], including call control operations and the ability to remotely activate certain DEVICE MGMT AGENTS [1.22].

[0342] Database information and feature-related parameters exchanged through this interface are structured according to these XML text format conventions, making it possible for them to be easily specified and/or interpreted by remote users. Remote users, which might include web applications and network management stations, access the XML MGMT INTERFACE through the HTTP PROTOCOL STACK [1.17].

DEVICE MGMT AGENTS [1.22]

[0343] Software applications integrated into the EDGE SWITCH [1] that may be activated to perform diagnostic functions, system software upgrades, feature testing, automated reporting, and other related device management tasks. The DEVICE MANAGEMENT AGENTS may be activated internally by EDGE SWITCH [1] software processes or remotely by various applications and network management stations through the XML MGMT INTERFACE [1.21] and/or the SNMP PROTOCOL STACK [1.18]. Certain DEVICE MANAGEMENT AGENTS may access databases on the FILE SYSTEM [1.23] for the purpose of accessing event records in the EVENT RECORD REPOSITORY [1.23.1] or to access CONFIGURATION PROFILES [1.23.5], for example.

FILE SYSTEM [1.23]

[0344] Software subcomponent in the EDGE SWITCH [1] that functions as directory-based file system; it supports standard file system operating semantics (open, close, read, write) and hierarchical directory structures, using the NON-VOLATILE MEMORY [1.12] as the physical storage device. The file system is implemented as a system resource, accessible through the operating system functions calls.

EVENT RECORD REPOSITORY [1.23.1]

[0345] Database stored on FILE SYSTEM [1.23] that contains event records generated by various software processes running on the EDGE SWITCH [1]. Event records stored in the EVENT RECORD REPOSITORY [1.23.1] are selectively generated by internal software processes according to the EDGE SWITCH [1] device configuration. Examples of the types of events that are stored include those that relate to basic system operations, detailed call session events for all incoming and outgoing calls, user access to calling features, detected error conditions, software component updates, and changes to subscriber preferences.

CALL PROCESSING APPLICATIONS [1.23.2]

[0346] Collection of software program files (applications) stored on the FILE SYSTEM [1.23] that are used by the EDGE SWITCH [1] to support network service delivery to users. CALL PROCESSING APPLICATIONS are invoked by the ABSTRACT CALL MODEL [1.20]. They define the service logic for all network services delivered to subscribers through TELEPHONE STATIONS [3] and SET-TOP BOXES [4]. They may function as call control agents that determine the progression of the call session, and/or they may function as device control agents that perform various telephone gateway and feature delivery functions.

[0347] They can reference other CALL PROCESSING APPLICATIONS [1.23.2], enabling the implementation of call control services (calling services) that impose no upper limit on the complexity of service logic that may be supported. The CALL PROCESSING APPLICATIONS are responsible for generating call-related event histories and storing them in the EVENT RECORD REPOSITORY [1.23.1] as the call session proceeds. In creating connections, the CALL PROCESSING APPLICATIONS rely upon call routing information stored in the LOCAL CALL ROUTING TABLES [1.23.3]. In rendering calling services, the CALL PROCESSING APPLICATIONS rely upon subscriber capabilities and personal preferences stored along with Class of Service information in the SUBSCRIBER SERVICE PROFILES [1.23.4]

LOCAL CALL ROUTING TABLES [1.23.3]

[0348] Database stored on FILE SYSTEM [1.23] that contains call routing information used by the EDGE SWITCH [1] for voice and video (multimedia) call set-up. Call routing tables include lists of dialing numbers and related address information used by CALL PROCESSING APPLICATIONS [1.23.2] to create connections between SIP network signaling endpoints. The LOCAL ROUTING TABLES store the dialing numbers of TELEPHONE STATIONS [1] physically plugged into the EDGE SWITCH [1], as well as dialing numbers needed to access PSTN GATEWAYS[8] installed within the IP CARRIER NETWORK [6] for the purpose of enabling voice call sessions to PSTN [7] endpoints.

[0349] Stored call routes provide default dialing numbers of Emergency 911 platforms to which TELEPHONE STATIONS [3] will automatically connected when 911 is dialed.

[0350] Tables of subscriber-programmed speed-dialing numbers may also be stored in call routing tables (managed by the subscriber or a remote user through an application running on a WEB SERVER [11]), making it possible for the TELEPHONE STATIONS [3] to support advanced speed-dialing functions without having to store the speed-dialing numbers within the TELEPHONE STATION [3].

[0351] LOCAL CALL ROUTING tables also store translation tables needed to support private telephone networking features, which include private dialing plans that use abbreviated dialing. Due to the substantial storage and processing capacity of the EDGE SWITCH [1], large dialing plans containing potentially tens of thousands of entries could be accommodated.

SUBSCRIBER SERVICE PROFILES [1.23.4]

[0352] Database stored on FILE SYSTEM [1.23] that contains subscriber-specific information used by the EDGE SWITCH [1] for all network service delivery to the subscriber. In the DES administrative model, each subscriber is associated with one more EDGE SWITCHES [1] that are installed at the subscriber premise for the purpose of network service delivery. A residence or single-location business entity may be viewed as a single subscriber, or in the case of a business with multiple locations (i.e. branch offices), a collection of subscribers.

[0353] Each subscriber enables a set of Class of Service "capabilities" (i.e. the subscriber purchases "capabilities" in the form of network services) that describes the collection of features, functions, and services that they would like to be able to access. These capabilities will determine which network services their particular EDGE SWITCH [1] will be capable of delivering.

[0354] The subscriber may then activate or deactivate selected Class of Service capabilities at their discretion. The collection of Class of Service capabilities that the subscriber has activated or deactivated is called their Class of Service "settings." A subscriber cannot activate any capability not previously enabled. The EDGE SWITCH [1] will not render any enabled capability that is not shown in the settings to be activated.

[0355] Once activated, a setting may require additional information from the subscriber in order for the corresponding feature, function, or service to operate correctly. For those settings, the subscriber configures "preferences" that further describe details as to exactly how the Class of Service settings should be interpreted. Preferences usually take the form of parameters that must be selected or typed in by the subscriber through a configuration application (e.g. telephone numbers, screen names, service options).

[0356] EDGE SWITCH [1] service delivery requires that subscriber Class of Service capabilities, settings, and preferences are stored locally in the FILE SYSTEM [1.23.4], each in the form of a machine-readable data object called a "service profile." Service profiles may be created to store subscriber-specific information required by a variety of applications. CALL PROCESSING APPLICATIONS [1.23.2] require service profiles as a means to store subscriber-specific parameters that effect their control flow. In some cases, service profiles may be created on the EDGE SWITCH [1] by certain network-based applications to function as "cookies," storing application-specific information required for service delivery.

CONFIGURATION PROFILES [1.23.5]

[0357] Database stored on FILE SYSTEM [1.23] that contains configuration information specific to a particular EDGE SWITCH [1] and used for its basic operation. In the DES administrative model, each subscriber is associated with one or more EDGE SWITCH [1], each of which may have a unique set of physical and network-related configuration parameters not directly related to Class of Service.

[0358] Virtually every software component of the EDGE SWITCH [1] requires a CONFIGURATION PROFILE that includes initialization and run-time parameters. As a few examples, CONFIGURATION PROFILES stored on the EDGE SWITCH [1] may include the number of terminals that it may have plugged into it, available bitrate of its connection to the BROADBAND ACCESS NETWORK [6.1], input/output buffer sizes, QoS parameters, IP routing parameters, IP address assignments, and function key layout profiles for TELEPHONE STATIONS [3].

EDGE SWITCH BASIC FEATURES [1.24]

[0359] The term EDGE SWITCH BASIC FEATURES refers to a specific collection of end-user features and functions that: (a) have become well-established in common use; (b) are likely to be highly-utilized on a day-to-day basis by the target subscriber group; and (c) are unlikely to change over time. The vast majority of voice, video, and data communications functions fall into this category, with features that include Customer Local Access Signaling Services (A.K.A. "CLASS features"), Centrex features, office telephone features, basic video channel selection, data firewall features, and Virtual Private (data) Networking, to name a few. EDGE SWITCH BASIC FEATURES are sorted into three broad categories according to the terminal type used to present them to the subscriber:

[0360] TELEPHONE STATION FEATURES

[0361] SET-TOP BOX FEATURES

[0362] COMPUTER WORKSTATION FEATURES

[0363] These feature categories define the core feature set of the EDGE SWITCH [1]. Network services are built up by

enabling collections of these basic features, and adding to them access to network-based features and services. A network-based feature may be used in some cases to override a basic feature for the purpose of providing enhanced or alternative functionality that is logically equivalent to the basic feature. The three categories of basic features are discussed below in detail:

TELEPHONE STATION FEATURES

[0364] For the purposes of this disclosure, the respective types of TELEPHONE STATION FEATURES will be differentiated on the basis of whether they generally enhance usability in a wide variety of subscriber environments, or whether the are primarily applicable to an office environment. The following list summarizes common features that "generally enhance usability in a wide variety of subscriber environments:"

[0365] Basic dial-tone

[0366] Automatic callback

[0367] Last number redial

[0368] Repeat dialing

[0369] Audible message-waiting indication (stutter dial tone)

[0370] Visible message-waiting indication (indicator lamp)

[0371] Distinctive ringing

[0372] Call-waiting indication/call-waiting cancel

[0373] Caller-ID with name

[0374] Call-blocking

[0375] Call-forwarding

[0376] Direct-connect

[0377] Emergency 911

[0378] The EDGE SWITCH [1] supports basic dial-tone, enabling the subscriber to originate (or receive) both on-network calls and off-network calls. Call-blocking features (A.K.A. "call-diverting features") enable the EDGE SWITCH [1] to block the origination of a call (outbound voice call) by a particular TELEPHONE STATION [3] based on the called party dialing number, or to block answering of a call (inbound voice calls) by a particular TELEPHONE STATION [3] based on the calling party dialing number. The EDGE SWITCH [1] supports configurable call blocking of this type, wherein the subscriber may selectively block inbound and/or outbound calls by specifying area codes, exchanges, and line numbers (or various combinations of the three).

[0379] Call-forwarding features enable the EDGE SWITCH [1] to automatically transfer (redirect) an inbound call based on a number of considerations. Call-forwarding features are often activated to automatically or conditionally transfers inbound calls to application servers for further processing or to provide access to NETWORK-BASED ENHANCED SERVICES [18]. Examples of NETWORK-BASED ENHANCED SERVICES [18] that may be accessed via call-forwarding include an auto attendant (used to answer calls directed to a main office number), voice mail, automatic call distribution, group conferencing bridge, or a personal call screening service. The EDGE SWITCH [1] supports configurable call-forwarding, wherein the subscriber may program it to redirect inbound calls based on:

[0380] Point of origination (determined by calling party dialing number);

[0381] Determination of a busy or "ring-no-answer" condition existing for the called party dialing number;

[0382] Determination that the incoming call is a fax or modem call;

[0383] Date, day of week, or time of day.

[0384] Direct-connect features (A.K.A. "direct-connect originating") enable the EDGE SWITCH [1] to automatically originate a call to a pre-programmed dialing number when a TELEPHONE STATION [3] goes off-hook, or upon the detection of some other event, such as a particular TELEPHONE STATION [3] function key sequence. Direct-connect features are often used for security telephones outside of a building, or at kiosks to provide immediate access to a call center help desk; they may also be used by the EDGE SWITCH [1] to implement speed-dialing by associating certain TELEPHONE STATION [3] key sequences with subscriber-programmed speed-dialing numbers stored in LOCAL CALL ROUTING TABLES [1.23.3].

[0385] Support for Emergency 911 (E911) is implemented by configuring the dialing number "911" as a reserved dialing number. Any call to the dialing number 911 creates a connection to a SIP APPLICATION SERVER [13] or TDM APPLICATION SERVER [7.4] (through a PSTN GATEWAY [8]) that supports emergency services intervention. SIP network signaling passes the calling party dialing number to the APPLICATION SERVER, which then may determine the physical (geographical) location of the calling party as would be required to support emergency services intervention.

[0386] Customer Local Access Signaling Services (A.K.A. "CLASS features) comprise an additional layer of features that make TELEPHONE STATIONS [3] more generally useful in both residential and office settings. Depending upon one's point of reference, there is a significant overlap between what some may consider "CLASS features" and "office telephone features." Many of the features mentioned above, such as Distinctive Ringing and Audible message-waiting indication are considered by most local exchange carriers as CLASS features. For the purposes of this disclosure, CLASS features are not viewed as a distinct feature set and are instead subsumed by the broader category of TELEPHONE STATION FEATURES.

[0387] Office telephone features (A.K.A. "Centrex" or "PBX features") comprise an additional layer of specialized features that make TELEPHONE STATIONS [3] more useful in an office environment. Certain office telephone features make it possible for a user at a TELEPHONE STATION [3] to transfer calls between TELEPHONE STATIONS [3] that may not necessarily be plugged into the same EDGE SWITCH [1]. In the case where TELEPHONE STATIONS [3] are not plugged into the same EDGE SWITCH [1], implementation of certain features may require special communication between EDGE SWITCHES

[1] in which a SIP call session is initiated from one to another, not to set-up a new call, but to request that a call in progress be managed in a particular way (e.g. transferred to a different SIP signaling endpoint residing on a different EDGE SWITCH [1]). The following list summarizes common office telephone features that are "primarily applicable to an office environment:"

[0388] Private telephone network (private dialing plan)

[0389] Speed dialing

[0390] Multiple line appearances

[0391] Three-way calling

[0392] Call-hold

[0393] Call-transfer

[0394] Call-pickup

[0395] Call-park

[0396] Call-waiting with display

[0397] Call log

[0398] Calling reason display

[0399] Do not disturb

[0400] Executive busy override

[0401] Feature button support

[0402] Make busy key

[0403] The DES as a system supports the ability to create a virtually unlimited number of private telephone networks (A.K.A. "virtual private telephone network" or "virtual telephone network") that are implemented by programming private dialing plans into participating EDGE SWITCHES [1]. Generally speaking, a private telephone network is a collection of telephone endpoints that may address each other as specific community of users, thus enabling the carrier to offer special configuration options and rate plans to participating subscribers. Often, on-network calls made between participating subscribers are billed at a flat rate. The private dialing plan is managed by the subscriber and supports abbreviated dialing number formats that seamlessly integrate with existing dialing plans (e.g. the North American Dialing Plan).

[0404] Private telephone networks may operate within a single IP CARRIER NETWORK [6] or within a wider area through a more expansive IP network infrastructure that consists of interconnected IP CARRIER NETWORKS [6]. Since EDGE SWITCH [1] support for private telephone networks is based on dialing numbers, a private telephone network can include both SIP network signaling endpoints within the IP CARRIER NEWORKS [6] and PSTN [7] endpoints accessible through a PSTN GATEWAY [8].

SET-TOP BOX FEATURES

[0405] SET-TOP BOXES [4] are known to the EDGE SWITCH [1] as stand-alone SIP network signaling endpoints. The EDGE SWITCH [1] assumes that they will originate and answer multimedia call sessions independently and will support only limited remote (indirect) control of their feature sets by CALL PROCESSING APPLICATIONS [1.23.2] running on the EDGE SWITCH [1]. SET-TOP BOXES [4] originate multimedia call sessions to SIP APPLICATION SERVERS [13] that are capable of delivering streaming video content to the connecting SET-TOP BOX [4].

[0406] In support of this type of video (multimedia) call session, the SIP PROTOCOL STACK [1.15] residing on the EDGE SWITCH [1] functions as a SIP Proxy Server, mediating the multimedia call session. the CALL PROCESSING APPLICATION [1.23.2] managing the multimedia call session may at the same time communicate with the SET-TOP BOX [5] over the IP connection to the access its internal feature set. The following list summarizes common SET-TOP BOX [5] features that should be implemented as EDGE SWITCH BASIC FEATURES:

[0407] Detect, decode, and translate multimedia channel selection protocol

[0408] Detect, decode, and translate interactive services protocols (e.g. pay-per-view)

[0409] Display text overlay on top of video image

[0410] Control audio output gain

[0411] Detect, decode, and translate camera control protocol for two-multimedia applications

[0412] Download/upload device settings and preferences

COMPUTER WORKSTATION FEATURES

[0413] These features relate to the EDGE SWITCH'S [1] ability to provide data connectivity through the COMPUTER DATA INTERFACE [1.4]. Data feature examples include:

[0414] Network Address Translation (NAT) to provide IP address support for multiple COMPUTER WORKSTATIONS [5];

[0415] Programmable firewall features used to support file system protection and content filtering;

[0416] Dynamic Host Configuration Protocol (DHCP);

[0417] Virtual Private (data) Networking (VPN);

[0418] Packet metering for connects that use QoS transport services;

[0419] Admission control, dialing number assignment, and protocol message grooming for SIP call sessions.

EDGE SWITCH OVERRIDE FEATURES [1.25]

[0420] The term EDGE SWITCH OVERRIDE FEATURES refers to a specific collection of end-user features and functions that provide alternative versions of EDGE SWITCH BASIC FEATURES [1.24]; they in some way modify or enhance the behavior of EDGE SWITCH BASIC FEATURES [1.24], and may be implemented internally by the EDGE SWITCH [1] as alternative versions CALL PROCESSING APPLICATIONS [1.23.2] used to implement EDGE SWITCH BASIC FEATURES [1.24]. They may also be implemented external to the EDGE SWITCH [1] as NETWORK-BASED OVERRIDE FEATURES [19]

that are transparently and dynamically accessed through the BROADBAND ACCESS NETWORK [6.1] when the feature is invoked. EDGE SWITCH OVERRIDE FEATURES implemented externally as NETWORK-BASED OVERRIDE FEATURES [19] are accessed by originating a SIP call session to a SIP APPLICATION SERVER [13].

SYSTEM MANAGEMENT PLATFORM [2]

[0421] All EDGE SWITCHES [1] are provisioned, configured, managed, and actively monitored by a SYSTEM MANAGEMENT PLATFORM deployed in a carrier central office, or central office equivalent. The SYSTEM MANAGEMENT PLATFORM is a scalable, fault-tolerant, high-availability network element that functions as the nexus between carrier operations support systems (A.K.A. "carrier OSS" or "back-office interfaces") and the EDGE SWITCHES [1] deployed at the subscriber premise; it does not directly participate in network service delivery at any time, but provides only a supporting, administrative role.

[0422] EDGE SWITCHES [1] do not interface the carrier OSS directly, but do so only through mediation by software applications running on the SYSTEM MANAGEMENT PLATFORM. The software applications running on the SYSTEM MANAGEMENT PLATFORM support the following DES system management functions:

[0423] Configure and upload software loads to the EDGE SWITCHES [1] as part of a provisioning or upgrade process;

[0424] Dynamically provision EDGE SWITCH [1] service capabilities (using default settings and preferences) according to a Class of Service provisioning model;

[0425] Actively monitor EDGE SWITCH [1] service delivery and report status through carrier OSS;

[0426] Remotely retrieve, view, and modify EDGE SWITCH [1] base configuration and subscriber Class of Service parameters through carrier OSS;

[0427] Remotely initiate EDGE SWITCH [1] diagnostics and system test procedures, and provide capability to report results through carrier OSS;

[0428] Synchronize EDGE SWITCH [1] information with same information stored in SYSTEM MANAGEMENT PLATFORM databases and information respositories, including Class of Service capabilities, Class of Service settings, subscriber preferences, local call routing tables, subscriber service profiles, and configuration profiles;

[0429] Collect event logs from EDGE SWITCHES [1], then store in databases and information respositories according to programmed policies;

[0430] Sort and re-format billable events, then forward to carrier OSS;

[0431] Provide for and adapt to all standardized carrier OSS requirements related to telecommunications service delivery (operations, administration, management and provisioning).

[0432] The software applications supporting these DES system management functions operate in conjunction with scalable databases and information repositories (for bulk storage) that are integral components within the SYSTEM MANAGEMENT PLATFORM. In some cases, SYSTEM MANAGEMENT PLATFORM databases store and manage information that duplicates specific subsets of information stored on the carrier's POLICY SERVER [14]. As a result, operations support system workflow models provide for some level of synchronization to ensure consistency between the DES and the carrier OSS.

[0433] SYSTEM MANAGEMENT PLATFORM databases and information respositories provide reliable, redundant storage for the following:

[0434] Administrative information needed to track and manage EDGE SWITCH [1] deployments at the subscriber premise, including a subscriber database that details the physical addresses, hardware revisions, software revisions, and physical locations of all EDGE SWITCHES [1] assigned to each subscriber;

[0435] Synchronized backup copy of all subscriber-specific information stored on every EDGE SWITCH [1], including Class of Service capabilities, Class of Service settings, subscriber preferences, local call routing tables, subscriber service profiles, and EDGE SWITCH [1] configuration profiles;

[0436] Software loads, event logs, service records, billing records, provisioning templates, diagnostic reports, and other operational information referenced by administrative information or received as output from the EDGE SWITCHES [1] in the course of network service delivery.

TELEPHONE STATION [3]

[0437] Terminal device that is plugged into the TELEPHONE LINE INTERFACE [1.9] and used for voice communications. The term "voice communications" refers to the ability of a terminal device to participate directly or indirectly as an endpoint in a "voice call session." A voice call session is defined as a SIP call session in which at least one bearer connection is transporting voice media content. A TELEPHONE STATION does not support SIP network signaling and cannot present itself to the IP CARRIER NETWORK [6] as a SIP network signaling endpoint; therefore it cannot participate directly in a voice call session and relies upon the EDGE SWITCH [1] to perform the necessary conversions.

[0438] A TELEPHONE STATION communicates with the EDGE SWITCH [1] directly through the TELEPHONE LINE INTERFACE [1.9] using analog electrical (or potentially digital) device-level telephone signaling (i.e. not network signaling). Beyond support for basic telephone line signaling (e.g. on-hook, off-hook, DTMF tone generation), device-level telephone signaling is used by the TELEPHONE LINE INTERFACE [1.9] to activate and control special features supported by the TELEPHONE STATION, such as illuminating message-waiting indication lamps or to detect feature key presses by the user. Ultimately, it becomes the task of the EDGE SWITCH [1] (through the TELEPHONE LINE INTERFACE [1.9] and other internal components) to convert the TELEPHONE STATION'S analog

or digital device-level telephone signaling and voice transmission conventions to and from IP packets containing SIP network signaling information and digitally-encoded voice, respectively.

[0439] TELEPHONE STATIONS [3] work best with EDGE SWITCH [1] features when they support function keys that the EDGE SWITCH [1] can convert to an appropriate user interface convention. EDGE SWITCH [1] CALL PROCESSING APPLICATIONS [1.23.2] and NETWORK-BASED ENHANCED SERVICES [18] are implemented with the highest possible degree of device-independence, and therefore rely upon user input (feature key presses) that comply to a known user interface convention.

[0440] A POTS telephone with programmable speed-dial keys or a PBX telephone with dedicated functions keys can both be used as TELEPHONE STATIONS [3]. In the case of supporting a POTS telephone, the TELEPHONE LINE INTERFACE [1.9] must embody "SLIC" (Subscriber Line Interface Circuit) functionality whereas in the case of supporting a digital PBX telephone, the TELEPHONE LINE INTERFACE [1.9] must support a particular, vendor-specific line-level interface for that device.

SET-TOP BOX [4]

[0441] Terminal device that is plugged into the VIDEO STREAMING DEVICE INTERFACE [1.5] and used for multimedia communications. The term "multimedia communications" refers to the ability of a terminal device to participate directly or indirectly as an endpoint in a "multimedia call session." A multimedia call session is defined as a SIP call session in which at least one bearer connection is transporting video media content. In this disclosure, the term "video call session" should be understood as synonymous with "multimedia call session." The use of the term "video" remains to preserve the general concept of the EDGE SWITCH [1] providing support for all three media types: voice, video, and data.

[0442] Depending on terminal device capabilities and network capabilities, a single multimedia call session may encapsulate any number of concurrent voice, video, and data bearer connections simultaneously, and any one of them may be operating in a half-duplex or full-duplex mode. By plugging and ETHERNET SWITCH [20] into the VIDEO STREAMING DEVICE INTERFACE [1.5], more than one SET-TOP BOX can be connected to the EDGE SWITCH [1].

[0443] To participate in multimedia call sessions, the SET-TOP BOX interfaces with a television set, using it as an audiovisual output device. A camera apparatus may be connected to and controlled by the SET-TOP BOX for two-way multimedia communications. As required for direct participation in a multimedia call session, the SET-TOP BOX supports SIP network signaling and presents itself to the IP CARRIER NETWORK [6] as a SIP network signaling endpoint. It communicates with the EDGE SWITCH [1] through the VIDEO STREAMING DEVICE INTERFACE [1.5] using: (a) a QoS IP connection; (b) SIP network signaling; and (c) a number of adjunct, vendor-specific device control protocols as required to implement EDGE SWITCH BASIC FEATURES [1.24] described for the SET-TOP BOX.

[0444] Since the EDGE SWITCH [1] is functioning as a SIP Proxy Server, mediating the multimedia call session originated by the SET-TOP BOX, it may directly communicate with the SET-TOP BOX over the same IP connection for the purpose of accessing its internal feature sets. Vendor-specific device control protocols may be implemented either as distinct protocols or as SIP extensions, depending on SET-TOP BOX requirements.

[0445] A telephone terminal that supports SIP network signaling and that can present itself to the IP CARRIER NETWORK [6] as a SIP network signaling endpoint is considered to be operationally identical to a SET-TOP BOX. A so-called "SIP phone" is an example of this type of terminal device. Accordingly, a SIP phone could be plugged into the VIDEO STREAMING DEVICE INTERFACE [1.5] and participate directly in a voice call session.

[0446] Whereas a SIP phone cannot be controlled directly by the TELEPHONE LINE INTERFACE [1.9] using device-level telephone signaling, access to its internal feature set must be accomplished by communicating with it through the IP connection to it, using SIP extensions and potentially other vendor-specific device control protocols as required to implement EDGE SWITCH BASIC FEATURES [1.24] described for the TELEPHONE STATION [3].

[0447] This disclosure has deliberately characterized SIP phones to be the functional equivalent of SET-TOP BOXES to avoid creating confusion between the direct control of telephone features through the TELEPHONE LINE INTERFACE [1.9] and the indirect control of telephone features through vendor-specific IP protocols.

COMPUTER WORKSTATION [5]

[0448] Terminal device that is plugged into the COMPUTER DATA INTERFACE [1.4] and used for data communications. In most cases, this terminal device will be a desktop PC with an Ethernet LAN adapter running an IP protocol stack. By plugging an ETHERNET HUB [9] into the COMPUTER DATA INTERFACE [1.4], more than one COMPUTER WORKSTATION can be connected to the EDGE SWITCH [1].

IP CARRIER NETWORK [6]

[0449] Large-scale, routed internet protocol (IP) network designed to support the delivery of voice, video, and data communications services to a subscriber base made up of potentially millions of subscribers. The IP CARRIER NETWORK is a private network offering controlled access to a public subscriber base. It is owned and operated by a telecommunications carrier (A.K.A. "facilities-based network service provider"). It consists of a backbone network that is used to interconnect a number of access networks, and all transmission paths through both the backbone network and the access network are engineered to ensure that both signaling and bearer channel connections can be maintained with a Quality of Service (QoS).

[0450] QoS generally refers to the ability of the network to honor certain quality guarantees (i.e. minimum bit transfer rates, maximum allowable latency, maximum allowable jitter, maximum rate of packet loss, etc.) as necessary to support real-time, full-duplex voice and video calls in addition to providing "best effort" data communications at specified minimum bitrates.

[0451] An IP CARRIER NETWORK is fully managed such that its performance (QoS transmission and service delivery) is monitored at all times. In addition, such a network supports the capability to be securely partitioned so as to logically or physically segregate subscriber data, and subscriber data types, from each other into Virtual Private (data) Networks. The IP CARRIER NETWORK in most cases is implemented as a hybrid network in that IP connectivity in the network layer (OSI Layer 3) may be transported over an ATM packet-switched infrastructure in the data link layer (OSI Layer 2).

BROADBAND ACCESS NETWORK [6.1]

[0452] Specific type of access network that is designed to provide a relatively high-bitrate IP data path to the subscriber premise. For the purposes of this disclosure, the term "high-bitrate" is used loosely here to characterize a minimum bit transfer rate of 128 Kbit/second for both the downstream (toward the premise) or upstream (away from the premise) direction. For most implementations without video support, it is recommended that BROADBAND ACCESS NETWORK support a nominal bit transfer rate of at least 500 kilobit/second for both the downstream or upstream direction. Support for video services would require a 20 megabit/second downstream bitrate capacity.

[0453] In addition to minimum bitrate requirements, the BROADBAND ACCESS NETWORK must support QoS for its connections. The BROADBAND ACCESS NETWORK is often described as the segment of the IP CARRIER NETWORK [6.1] that bridges the "last mile" between the central office and the subscriber premise. Examples of "last mile" technologies that are suitable for integration into the BROADBAND NETWORK INTERFACE [1.1] include Digital Subscriber Line (DSL), coaxial cable, T1 in unchannelled mode, and Passive Optical Network (PON).

DC POWER SOURCE [6.2]

[0454] The EDGE SWITCH [1] is a computing device that requires a DC POWER SOURCE to operate. BROADBAND ACCESS NETWORKS [6.1] based on DSL or coaxial cable usually provide power through the copper wire or cable, respectively. In some cases, this source is sufficient to power the EDGE SWITCH [1]. Otherwise, power must be provided at the premise.

PSTN [7]

[0455] Public Switched Telephone Network. The network depicted in FIG. 1 consisting of CENTRAL OFFICE SWITCHES and a TDM TRANSPORT NETWORK.

CENTRAL OFFICE SWITCH [7.1]

[0456] End-office switch deployed in a central office as the PSTN [7] network element used to provide telephone service to network subscribers. It is the same as the CENTRAL OFFICE SWITCH depicted in FIG. 1. The telephone features provided by the CENTRAL OFFICE SWITCH are virtually identical to the TELEPHONE STATION FEATURES described as a subset of the EDGE SWITCH BASIC FEATURES [1.24].

T1/E1/PRI [7.2]

[0457] T1, E1 or ISDN Primary Rate Interface digital trunk interfaces used in the PSTN [7]. T1, E1, and PRI are based upon circuit-switched time division multiplex (TDM) technology; they enable the transmission of voice or bearer channel content along with varying degrees of network signaling information.

SS#7[7.3]

[0458] Signaling System #7; the out-band signaling network used in the PSTN [7].

TDM APPLICATION SERVER [7.4]

[0459] Application server deployed in a central office as a PSTN [7] network element used to provide NETWORK-BASED ENHANCED SERVICES [18] to network subscribers. The TDM APPLICATION SERVER contains hardware and software components required to support the operation of one or more NETWORK-BASED ENHANCED SERVICES [18]. It typically presents access to these services through a digital trunk interface (see T1/E1/PRI [7.2]).

[0460] The TDM APPLICATION SERVER operates conceptually as an array of "computer-controlled" telephones in which the service logic contained in a software application program replaces a human operator as the controlling entity. According to this model, the software application program is able to use a variety of system resources (databases, speech recognition systems, media storage systems) to provide computer-controlled, personalized network services to connecting voice telephones.

PSTN GATEWAY [8]

[0461] PSN connectivity element that translates network signaling and bearer channel encoding formats so as to enable a call session in which one end of the call is a SIP network signaling endpoint in the IP CARRIER NETWORK [6] and the other end is a legacy TDM endpoint in the PSTN [7].

ETHERNET HUB [9]

[0462] Simple, low-cost, multi-port data distribution device that enables data communications to occur between all network devices plugged into it using Ethernet technology or the equivalent. This type of device has only modest transmission capacity and therefore cannot guarantee that a certain minimal bandwidth is maintained for each data path passing through it. This device may operate in a wired or wireless capacity.

DNS SERVER [10]

[0463] Distributed database application (A.K.A. "Domain Naming Server") that works at the transport layer (OSI Layer 4—above the network layer) to provide name-to-address mapping for all client applications in an IP network. The client applications can include e-mail, web hosting, and SIP-based telecommunications. It is a component in the DES carrier reference network architecture and serves multiple purposes as it would in any IP-based network architecture.

[0464] Three principal DNS SERVER functions stand out as most significant to the operation of the DES:

[0465] Translate generic network element names into one or more IP addresses that correspond to actual physical instances of that network element type;

[0466] Convert E.164 dialing numbers into IP addresses as required for call routing with the IP network;

[0467] Enable load balancing by providing IP addresses for multiple instances of a certain type of network element or other network resource.

WEB SERVER [11]

[0468] Software application program that implements support for the "web server" functionality described by IETF RFC 2068 on Hypertext Transfer Protocol—HTTP Version 1.1 (HTTP). The WEB SERVER is a component in the DES carrier reference network architecture and primarily used as a means to enable subscribers to communicate indirectly with EDGE SWITCHES [1] for the purposes of interactive configuration and interactive network service delivery.

[0469] With respect to interactive configuration, the WEB SERVER presents a web browser-based graphical user interface that enables subscribers to selectively enable or disable Class of Service settings and then to control or input preferences that relate to the delivery of activated network services. The WEB SERVER performs an authenticated log-in to the subscriber's EDGE SWITCH [1], and thus functions as an intermediary agent to ensure that the subscriber's settings and preferences are written to the target EDGE SWITCH [1] in a secure and syntactically correct manner.

[0470] To support interactive network service delivery to the subscriber, the WEB SERVER once again functions as an intermediary agent, hosting service-related applications that enable browser-based interactions between the subscriber and the EDGE SWITCH [1]. The WEB SERVER again performs an authenticated log-in to the subscriber's EDGE SWITCH [1], but this time for the purposes of (a) accessing call log data stored within it so that it may be used as application data, and (b) exerting control over internal EDGE SWITCH [1] features, such as originating or answering a call.

SIP PROXY SERVER [12]

[0471] This term refers specifically to a network-based implementation of a stand-alone SIP Proxy Server (or SIP Proxy Server cluster) and not to the SIP Proxy Server functionality supported by the SIP PROTOCOL STACK [1.16]. While the SIP Proxy Server functionality supported by both is essentially identical, they operate independently in support of different roles.

[0472] According to IETF RFC 2543 on SIP: Session Initiation Protocol a SIP PROXY SERVER is defined as follows:

[0473] "An intermediary program that acts as both a server and a client for the purpose of making requests on behalf of other clients. Requests are serviced internally or by passing them on, possibly after translation, to other servers. A proxy interprets, and, if necessary, rewrites a request message before forwarding it."

[0474] The SIP PROXY SERVER is a component in the DES reference carrier network architecture and is required to support many SIP network signaling operations within it by shuttling SIP messages back and forth between two or more SIP User Agents participating in a SIP call session.

[0475] Specifically, the SIP PROXY SERVER functions much like an intermediary SIP message router to ensure that the SIP network signaling messages to/from the SIP endpoints in the network are ultimately channeled to the correct destination. In this message-routing capacity, several SIP PROXY SERVERS can cooperate to pass SIP network signaling messages bi-directionally through a hierarchy of SIP PROXY SERVERS, each of which gets it closer to the target endpoint. SIP PROXY SERVERS access both the DNS SERVER [10] and the POLICY SERVER [14] to determine how to route SIP call sessions within the IP CARRIER NETWORK [6].

SIP APPLICATION SERVER [13]

[0476] ESN connectivity element deployed in an IP CARRIER NETWORK [6] to provide NETWORK-BASED ENHANCED SERVICES [18] to network subscribers. The SIP APPLICATION SERVER contains hardware and software components required for the operation of one or more NETWORK-BASED ENHANCED SERVICES [18]. It presents itself as a SIP network signaling endpoint that may communicate with any other SIP network signaling endpoint in a SIP call session.

[0477] It is assumed that the SIP APPLICATION SERVER will provide a means, directly or indirectly, to support one or more RTP bearer channel connections that are likely to be required for voice or multimedia call sessions. Because bearer channel capabilities for these SIP-based call sessions are assumed, the SIP APPLICATION SERVER may viewed conceptually to operate as an array of "computer-controlled" voice or multimedia terminals in which the service logic contained in a software application program replaces a human operator as the controlling entity.

[0478] According to this model, the software application program is able to use a variety of system resources (databases, speech recognition systems, media storage systems) to provide computer-controlled, personalized network services to connecting voice or multimedia terminals.

[0479] As a consequence of the fact that most call sessions in which the SIP APPLICATION SERVER participates are mediated through a SIP PROXY SERVER [12], each SIP signaling path created to support these call sessions may be used as a context to invoke additional capabilities of the SIP PROXY SERVER [12].

[0480] By exchanging SIP messages with the SIP PROXY SERVER [12] (through the SIP signaling path created to support a call session), the application program responsible for controlling a call session may perform complex call control operations, such as to transfer calls, add/drop call participants, or connect to a specialized type of SIP APPLICATION SERVER [13] called a "media server" for the purpose of invoking media services. A media server is capable of supporting media-intensive application services

such as speech recognition, interactive voice response, or music-on-hold. Media servers are called "dialog servers" when they interpret and execute interactive voice response commands written in Voice XML.

POLICY SERVER [14]

[0481] Collection of database applications owned, operated, and maintained by the carrier for the purpose of managing network service delivery to network subscribers. These database applications are referred to collectively as a POLICY SERVER for two reasons:

[0482] (a) It is a practical impossibility to accurately characterize a "generic" carrier policy database server configuration; carrier network elements of this type will vary according to their unique network infrastructure requirements;

[0483] (b) It is a practical impossibility to accurately characterize how a particular carrier logically organizes its information; each may conceive schema and/or combine data objects in very different ways that will vary according to their unique network infrastructure requirements;

[0484] The POLICY SERVER thus represents a logical entity that stores essential network operational support information and enable DES system elements to access that information. Information stored on the POLICY SERVER includes:

[0485] Subscriber-specific information (Class of Service, account status, service profiles, preferences);

[0486] Connection policies and related call routing information; dialing plans;

[0487] Billing policies and rate plans for service delivery; General network authentication services for all human and machine users.

[0488] The connection policies are abstract data representations of the control logic necessary to route calls, invoke services, and perform other interconnection operations that define the behavior of the SIP PROXY SERVER [12] as it establishes specific call paths through the IP CARRIER NETWORK [6].

NETWORK PROVISIONING SYSTEM [15]

[0489] Network operations support system used by carrier to enable, disable, or modify network service delivery for network subscribers.

NETWORK OPERATIONS CENTER [16]

[0490] Network operations support system used by carrier to configure, monitor, troubleshoot, and manage network elements involved in delivering network services to network subscribers.

NETWORK BILLING SYSTEM [17]

[0491] Network operations support system used by carrier to collect billing records from network elements involved in delivering network services to network subscribers, and then to convert them to customer invoices based on billing policies and rate plans.

NETWORK-BASED ENHANCED SERVICES [18]

[0492] In contrast to NETWORK-BASED OVERRIDE FEATURES [19], NETWORK-BASED ENHANCED SERVICES are typically stand-alone network services that perform complete, independent functions; they are not functionally bound to any EDGE SWITCH [1] feature, but are generally accessible through the IP CARRIER NETWORK [6] using TELEPHONE STATIONS [3] and/or SET-TOP BOXES [4] plugged into and EDGE SWITCH [1]. They are general-interest applications that appeal to a wide audience.

[0493] Examples of NETWORK-BASED ENHANCED SERVICES include voice call-answering, group audio conferencing, language translation services, or video content delivery. Most NETWORK-BASED ENHANCED SERVICES are suitable to be offered as either stand-alone applications or as part of an overall services package that incorporates other features and services. An important distinction between EDGE SWITCH BASIC FEATURES [1.24] and NETWORK-BASED ENHANCED SERVICES is that the latter are not substitutes for, or alternative versions of, EDGE SWITCH BASIC FEATURES [1.24], but are independent, companion network services with which EDGE SWITCH BASIC FEATURES [1.24] must interoperate.

NETWORK-BASED OVERRIDE FEATURES [19]

[0494] Special-purpose, network-based applications that work in conjunction with EDGE SWITCH OVERRIDE FEATURES [1.25] for the purpose of imparting the EDGE SWITCH [1] with more advanced feature delivery capabilities. Advanced features of this type are likely to appeal to only a select subset of subscribers and/or are potentially costly to implement; thus they do not meet the requirements necessary to be implemented as EDGE SWITCH BASIC FEATURES [1.24].

[0495] An simple example of a NETWORK-BASED OVERRIDE FEATURE is an "inbound call management" network-based application (implementing the feature) that enables the end-user to accept or deny an incoming call from the PC desktop. In this case, the EDGE SWITCH [1] would transfer the inbound call to a network-based application rather than simply ringing the TELEPHONE STATION [1]. The network-based application would support a NETWORK-BASED OVERRIDE FEATURE that would present the identity of the calling party on the PC desktop (through a web browser graphical user interface). If the end-user accepts the incoming call through the web browser graphical user interface, the NETWORK-BASED OVERRIDE FEATURE transfers the call back to the EDGE SWITCH [1] with a marker indicating that call-setup should be allow to proceed in the normal fashion.

ETHERNET SWITCH [20]

[0496] Multi-port data distribution device based on Ethernet technology. The ETHERNET SWITCH enables data communications to occur between all network devices plugged into it at the same time, and is able to guarantee a minimal amount of bandwidth for each data transmission path passing through it. This device may operate in a wired or wireless capacity.

SUBSCRIBER NETWORK INTERFACE (POTS) [22]

[0497] Demarcation point that defines the interface between the public carrier network (PSTN [7] or IP CARRIER NETWORK [6]) and the subscriber's inside wiring plant. The SUBSCRIBER NETWORK INTERFACE (A.K.A. "Telco Entrance Facility") is required to be physically located in a "publicly accessible place." Its physical manifestation is usually a modest wire interface device (channel bank) used to connect copper wires from the street to the copper wiring within the premise. From a regulatory perspective, everything on the network side of the SUBSCRIBER NETWORK INTERFACE is the responsibility of the carrier and everything on the premise side is the responsibility of the subscriber. For residential telephone service, the SUBSCRIBER NETWORK INTERFACE is usually located on the outside of the residence. Businesses often have more complex termination requirements and allocate a wiring closet to serve this purpose.

[0498] A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1. A network device comprising:

a plurality of communication interfaces, including a telephone line interface, a computer data interface, and a broadband network interface;

a processor;

a machine-readable storage medium which during use stores a call processing application and service profiles, and which stores executable instructions to mediate communications between the plurality of communication interfaces, the instructions causing the network device to

detect network signaling events or trigger points in a telephone call and

invoke the call processing application in response to the detected network signaling events or trigger points, the call processing application operating according to parameters defined in the service profiles.

2. The network device of claim 1, wherein the plurality of communication interfaces further includes a video streaming device interface.

3. The network device of claim 1, wherein the broadband network interface terminates a broadband network link that joins a customer premises to a packet carrier network.

4. The network device of claim 1, wherein the instructions further cause the network device to route IP data between the computer data interface and the broadband network interface.

5. The network device of claim 1, wherein the network device is contained in a single physical enclosure.

6. The network device of claim 1, wherein the instructions further cause the network device to provide a first SIP proxy agent to represent a telephone that uses the telephone line interface, and provide a second SIP proxy agent to represent a computer that uses the computer data interface.

7. The network device of claim 1, wherein the storage medium during use further stores call routing tables, and

the instructions further cause the network device to perform call routing for telephone calls that use the telephone line interface.

8. The network device of claim 1, wherein the storage medium during use further stores call routing tables, and

the instructions further cause the network device to perform call routing for telephone calls according to the call routing tables, the telephone calls using the telephone line interface.

9. A network device comprising:

a plurality of communication interfaces, including a telephone line interface, a computer data interface, and a broadband network interface;

a processor;

a machine-readable storage medium which during use stores call routing tables, and which stores executable instructions to mediate communications between the plurality of interfaces, the instructions causing the network device to perform call routing according to the call routing tables, the telephone calls using the telephone line interface.

10. The network device of claim 9, wherein call routing includes peer-to-peer call signaling between customer premises over a shared IP network.

11. The network device of claim 10, wherein the call signaling is performed without requiring stateful elements of the shared IP network above the IP infrastructure.

12. The network device of claim 10, wherein the broadband network interface terminates a link that joins the network device to the shared IP network.

13. The network device of claim 9, wherein call routing includes call signaling to a PSTN endpoint via a PSTN gateway that is reachable over the broadband network interface.

14. The network device of claim 9, wherein the network device is contained in a single physical enclosure.

15. The network device of claim 9, wherein the instructions further cause the network device to route IP data between the computer data interface and the broadband network interface.

16. The network device of claim 9, wherein the plurality of communication interfaces further includes a video streaming device interface.

17. A network device comprising:

a plurality of communication interfaces, including a telephone line interface, a computer data interface, and a broadband network interface;

a processor; and

a machine-readable storage medium which stores executable instructions to mediate communications between the plurality of interfaces, the instructions causing the network device to log a telephone event record to a telephone event repository, the event record describing a telephone call communication mediated by the network device.

18. The network device of claim 17, wherein the telephone event repository is included in the network device.

19. The network device of claim 17, wherein the telephone event repository is remote relative to the network device.

20. The network device of claim 17, wherein the network device is contained in a single physical enclosure.

21. The network device of claim 17, wherein the plurality of communication interfaces further includes a video streaming device interface.

22. A network device comprising:

a broadband network interface;

a plurality of interfaces, including a telephone line interface and a computer data interface;

a processor; and

a machine-readable storage medium that stores processor-executable instructions to provide proxy agents, the instructions causing the network device to

provide a telephone SIP proxy agent to represent a non-SIP telephone that uses the telephone line interface, and

provide a distinct SIP proxy agent for each additional device that uses an interface in the plurality of interfaces, and

the instructions further causing the network device to implement a proxy server that mediates all SIP communications over the broadband network interface involving the non-SIP telephone and the each additional devices.

23. The network device of claim 22, wherein the computer data interface passes IP data.

24. The network device of claim 22, wherein the plurality of interfaces includes a video streaming device interface.

25. The network device of claim 22, wherein the network device is contained in a single physical enclosure.

26. A method for establishing a voice-over-packet network architecture, the method comprising:

locating a system management platform in a shared packet network, the system management platform collecting call log data from a plurality of network devices; and

distributing the plurality of network devices that each include

a telephone line interface,

a computer data interface,

a broadband network interface terminating a link from the shared packet network,

a processor, and

a machine-readable storage medium storing processor-executable instructions to control telephone calls, the instructions causing each network device to route telephone calls in a peer-to-peer fashion over the shared packet network and to send call log data to the system management platform.

27. The method of claim 26, wherein for each device the broadband network interface terminates a link from the shared packet network.

28. The method of claim 26, wherein the routing of telephone calls includes SIP signaling.

29. The method of claim 26, wherein the storage medium further stores processor-executable instructions to act as an SIP proxy server for devices using the telephone line interface and for devices using the computer data interface.

30. The method of claim 26, wherein the shared packet network uses IP protocols.

31. The method of claim 26, wherein the shared packet network uses ATM protocols.

32. The method of claim 26, wherein the plurality of network devices each further include a video streaming device interface

* * * * *

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF TEXAS

TEXARKANA DIVISION

ESN, LLC, Plaintiff, v. CISCO SYSTEMS, INC., and CISCO-LINKSYS, LLC, Defendants.	)	Civil Action No. 5:07-cv-156-DF-CMC JURY DEMANDED

EXHIBIT B

Peter McAndrews

From: b.hollander5674@gmail.com
Sent: Friday, August 11, 2006 1:36 PM
To: legal@cisco.com
Cc: ggirard@girardcp.com; Peter McAndrews
Subject: Patent application of interest to Cisco

Attachments: ENVELOPE.TXT

ENVELOPE.TXT (2 KB)

To whom it may concern:

I am a Member of ESN, LLC located in Hartford, CT. The other Member of the company is Greg Girard, the inventor of published U.S. Patent Application No. 10/122,589, entitled Distributed Edge Switching System For Voice-Over-Packet Multiservice Network. The Chicago law firm of McAndrews, Held & Malloy is our outside law firm.

We have begun discussions with potential infringers and patent investors who could benefit from owning the application or owning/licensing the patent(s) that issue from the application. Based on our review of publicly available information about certain of Cisco's VoIP products, and Cisco's published U.S.Patent Application No. 2006/0089991, entitled Providing A Proxy Server Feature At An Endpoint, it would appear that Cisco might have an interest in exploring such a business transaction.

We have a clear sense of the type of transaction we would be willing to do now, which we believe would be attractive to Cisco. We would be prepared to share our ideas with you as part of a serious business discussion.

Brian L. Hollander
ESN, LLC
860-916-7200
b.hollander5674@gmail.com

Peter McAndrews

From: b.hollander5674@gmail.com
Sent: Friday, August 11, 2006 1:53 PM
To: dproctor@cisco.com
Cc: ggirard@girardcp.com; Peter McAndrews
Subject: U. S. Patent Application 10/122,589

Attachments: ENVELOPE.TXT

ENVELOPE.TXT (2 KB)

Dear Mr. Proctor,

I am sending this email to you because you appear to be the most appropriate member of the Executive Team listed on the Cisco website to receive a VoIP related communication. I tried to locate inside patent counsel through a Cisco operator, but as I am sure you know this is an impossible task without a name.

I am a Member of ESN, LLC located in Hartford, CT. The other Member of the company is Greg Girard, the inventor of published U.S. Patent Application No. 10/122,589, entitled Distributed Edge Switching System For Voice-Over-Packet Multiservice Network. The Chicago law firm of McAndrews, Held & Malloy is our outside law firm.

We have begun discussions with potential infringers and patent investors who could benefit from owning the application or owning/licensing the patent(s) that issue from the application. Based on our review of publicly available information about certain of Cisco's VoIP products, and Cisco's published U.S.Patent Application No. 2006/0089991, entitled Providing A Proxy Server Feature At An Endpoint, it would appear that Cisco might have an interest in exploring such a business transaction.

We have a clear sense of the type of transaction we would be willing to do now, which we believe would be attractive to Cisco. We would be prepared to share our ideas with you as part of a serious business discussion.

Brian L. Hollander
ESN, LLC
860-916-7200
b.hollander5674@gmail.com

IN THE UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF TEXAS

TEXARKANA DIVISION

ESN, LLC, Plaintiff, v. CISCO SYSTEMS, INC., and CISCO-LINKSYS, LLC, Defendants.	)	Civil Action No. 5:07-cv-156-DF-CMC JURY DEMANDED

EXHIBIT C

mcandrews
McANDREWS HELD & MALLOY LTD

500 WEST MADISON STREET 34TH FLOOR CHICAGO ILLINOIS 60661
(T) 312 775 8000 (F) 312 775 8100 www.mcandrews-ip.com

PETER J. MCANDREWS
(T) 312 775 -8000
pmcandrews@mcandrews-ip.com

June 8, 2007

VIA EMAIL

Kurt M. Pankratz
Baker Botts L.L.P.
2001 Ross Avenue
Dallas, TX 75201-2980

Re: U.S. Patent Application Publication No. 2002/0176404

Dear Kurt,

We are somewhat disappointed that Cisco is refusing to hold open and honest discussions pursuant to Rule 408 in an effort to avoid litigation. Nevertheless, we believe that both parties can benefit from moving forward with discussions that may lead to Cisco taking a license to, or purchasing, ESN, LLC's pending U.S. Patent Application Publication No. 2002/0176404 ("the '404 Application") and the related U.S. Patent Application Publication No. 2007/0110043 ("the '043 Application"). We base this primarily on a firm belief that Cisco is, and has been, making, using, selling, and offering for sale products that embody the subject matter of one or more claims of the '404 Application.[1]

A preliminary analysis of an example Cisco product in view of example pending claims of the '408 Application is provided in the attached claim chart (Exhibit A). Our analysis is obviously preliminary in view of the fact that it is based upon the limited technical information that is publicly available for these products. Only the Cisco ISR 2851 is analyzed in the attached claim chart as an example, however, we believe that the following products embody the subject matter of one or more claims of the '404 Application:

- the Linksys SPA-9000 product (at least as configured with the components described in Exhibit B attached hereto)
- the Linksys One SVR-3000 product (at least as configured with the components described in Exhibit C attached hereto)

[1] Cisco's products and related conduct also contribute to and/or induce the practice of methods covered by one or more claims of the '404 application.

mcandrews
McANDREWS HELD & MALLOY LTD

- Cisco ISR models, for example, the 2800 and 3800 series models, which include Cisco's CallManager Express or Communication Manager Express.

Your letter states that you have "reviewed the '404 Application and do not believe that it has relevance to any current or planned Cisco products." While we doubt the sincerity of that statement, we request that you explain the facts and analyses upon which you based this statement. Additionally, after you have had a chance to review our preliminary analysis, if you disagree with our analysis in any way, we invite you to point out and explain any disagreement with our analysis and provide any information that you believe may support your explanation. We ask for a complete analysis since on present information we would be seeking enhanced damages, if litigation ensues, for any continued infringement beyond the issue date of the '404 application.

Your paragraph attributing statements to us regarding the relationship between the '404 Application and Cisco's pending U.S. Patent Application Serial No. 10/973,146 ("the '146 Application) mischaracterizes the parties' communications on this topic. We further note that you fail to point out what references, if any, are relevant or material to the prosecution of the '404 Application due to a relationship to the '146 Application. Undoubtedly, this is due in part to the fact that Cisco, through your firm, has made arguments to the U.S. Patent Office that are contrary to such a position. Whatever the intent of your discussion of references cited against the '146 Application, the issue is moot since we have disclosed all such references to the U.S. Patent Office in the prosecution of the '404 Application.

More to the point, we do not believe that any of the references cited against the '146 Application are material to the examination of the '404 Application. Indeed, many do not even qualify as prior art given that the priority date for the '404 Application is two and one half years prior to that of Cisco's '146 Application. Thus, we are confident that the pending claims will be allowed in their present form.

Since we fully expect the current claims to issue in their present form, upon issuance of the '404 Application as a patent, potential damages in a patent infringement action will include all infringing activity occurring since Cisco had actual knowledge of the published '404 Application. Cisco has had actual knowledge since at least as early as August 11, 2006.

While we had hoped that the parties exchange would not devolve to the discussion of litigation, your asserted ignorance of the relevance of the '404 Patent to Cisco's product

mcandrews
McANDREWS HELD & MALLOY LTD

10 months after ESN brought it to Cisco's attention (with numerous written and verbal communications between Mr. Lang and Mr. Hollander in the interim) and the obvious attempt in your letter to fabricate an inequitable conduct defense, suggests that ESN may have to pursue other means to resolve this dispute. Nevertheless, ESN is willing to delay completing certain alternative business arrangements for a short time to provide an opportunity to discuss a reasonable business arrangement if Cisco has a serious interest in having such a discussion.

We look forward to receiving your response.

Very truly yours,

Peter J. McAndrews

Enclosures

Exhibit A
Preliminary Comparison of '404 Application Claims to Cisco's ISR 2851

Claim 1	ISR 2851
1. A network device comprising:	The ISR 2851 is a network device.
a plurality of communication interfaces, including a telephone line interface, a computer data interface, and a broadband network interface;	The ISR 2851 includes a telephone line interface for connecting, for example, analog telephones or fax machines. For example, the ISR 2851 is configured to include one or more Extension Voice Modules ("EVM"). The type of EVM depends on the nature and number of the analog connections. The ISR 2851 includes a computer data interface for connecting, for example, computers to allow the computers to communicate data over the Internet via the broadband access network. For example, the ISR 2851 is configured to include one or more Ethernet interfaces. The ISR 2851 includes a broadband network interface for connecting the 2851 to a broadband access network. For example, the ISR 2851 is configured to include one or more High-Speed Wan Interface Cards ("HWIC"). The type of HWIC depends on the broadband access network carrier.
a processor;	The ISR 2851 includes one or more processors.
a machine-readable storage medium which during use stores a call processing application and service profiles, and which stores executable instructions to mediate communications between the plurality of communication interfaces,	The ISR 2851 includes a machine-readable storage medium that stores, among other system software components and databases, Cisco's "Communication Manager Express" (formerly "CallManager Express") software instructions ("CME"). CME software instructions that mediate communications between ISR 2851 interfaces includes one or more call processing applications (i.e. Session Applications) operating in concert with, e.g., a Virtual Telephony Service Provider Interface, a Packet Network Service Provider, and a Call Control API. Service profiles stored on the ISR 2851 contain, for example, call routing tables (dial peers), call routing policies, user-specific capabilities/settings, administrative information, and user authentication data.
the instructions causing the network device to detect	Virtual Telephony Service Provider (VTSP) interface and Packet Network Service Provider (PNSP) detect network

network signaling events or trigger points in a telephone call and invoke the call processing application in response to the detected network signaling events or trigger points,	signaling events and device-level states from analog telephones and IP telephones, respectively, that are participating in a telephone call. The telephone may be interfaced directly to the ISR 2851 or accessible to the ISR 2851 by communicating through the broadband access network. The VTSP and PNSP make these events and states available to the Call Control API (CCAPI). The CCAPI then makes them available to a Session Application. According to its service logic, the Session Application may respond by invoking a particular CCAPI operation that controls: the delivery of a particular calling service; the overall progression of the telephone call; the number of call participants; and/or the activation of telephone feature defined for a calling service.
the call processing application operating according to parameters defined in the service profiles.	A Session Application relies upon, inter alia, call routing tables (dial peers), call routing policies, user-specific capabilities/settings, administrative information, and user authentication data when executing its service logic.
Claim 22	**ISR 2851**
22. A network device comprising:	The ISR 2851 is a network device.
a broadband network interface;	The ISR 2851 includes a broadband network interface for connecting the 2851 to a broadband access network. For example, the ISR 2851 is configured to include one or more High-Speed Wan Interface Cards ("HWIC"). The type of HWIC depends on the broadband access network carrier.
a plurality of interfaces, including a telephone line interface and a computer data interface;	The ISR 2851 includes a telephone line interface for connecting, for example, analog telephones or fax machines. For example, the ISR 2851 is configured to include one or more Extension Voice Modules ("EVM"). The type of EVM depends on the nature and number of the analog connections. The ISR 2851 includes a computer data interface for connecting, for example, computers to allow the computers to communicate data over the Internet via the broadband access network. For example, the ISR 2851 is configured to include one or more Ethernet interfaces.
a processor; and	The ISR 2851 includes one or more processors.

a machine-readable storage medium that stores processor-executable instructions to provide SIP agents, the instructions causing the network device to provide a SIP user agent to represent a non-SIP telephone that uses the telephone line interface, and	The ISR 2851 includes a machine-readable storage medium comprising storage devices located within the ISR 2851. Instructions stored on the storage devices collectively provide, for example, one or more SIP agents: a SIP user agent, a SIP proxy, SIP redirect service, and a back-to-back SIP user agent. A SIP user agent is used to represent each analog (non-SIP) telephone interfaced to a telephone line interface provided by an ISR 2851 Extension Voice Module ("EVM). An analog telephone interfaced to the EVM is monitored and controlled by the CME Virtual Telephony Service Provider (VTSP) interface software element. The VTSP operates in concert with the CME Call Control API and one or more Session Applications to enable the telephone to be represented by a SIP user agent that performs SIP communications on behalf of the telephone. This SIP user agent enables the telephone to be managed as a SIP endpoint device by the back-to-back user agent, an element of the SIP proxy executing within the ISR 2851.
the instructions farther causing the network device to implement a SIP proxy server that mediates all SIP communications over the broadband network interface involving the non-SIP telephone.	The CME also causes the ISR 2851 to implement a SIP proxy server that mediates all SIP communications over the broadband network interface involving the non-SIP (analog) telephone. In particular, the ISR 2851 provides a "stateful" SIP proxy that includes a back-to-back user agent.
Claim 26	**ISR 2851**
26. A method for establishing a voice-over-packet network architecture, the method comprising:	Cisco provides the ISR 2851 and related equipment which establishes a voice-over-packet network.
locating a system management platform in a shared packet network, the system management platform collecting call log data from a plurality of network devices; and	Cisco provides a range of a system management platforms to be deployed in a shared packet network. For example, Cisco provides the MIND-M.E.IP.S. that may collect call records directly from two or more ISRs.
distributing the plurality of network devices that each	Cisco provides ISRs, e.g., ISR 2851s or other ISRs.

include a telephone line interface, a computer data interface, a broadband network interface terminating a link from the shared packet network,	The ISR 2851 includes a telephone line interface for connecting, for example, analog telephones or fax machines. For example, the ISR 2851 is configured to include one or more Extension Voice Modules ("EVM"). The type of EVM depends on the nature and number of the analog connections. The ISR 2851 includes a computer data interface for connecting, for example, computers or SIP phones to allow the computers or SIP phones to communicate data (including voice data) over the Internet. For example, the ISR 2851 is configured to include one or more Ethernet interfaces. The ISR 2851 includes a broadband network interface for connecting the 2851 to a broadband access network. For example, the ISR 2851 is configured to include one or more High-Speed Wan Interface Cards ("HWIC"). The type of HWIC depends on the broadband access network carrier.
a processor, and	The ISR 2851 includes one or more processors.
a machine-readable storage medium storing processor-executable instructions to control telephone calls, the instructions causing each network device to	The ISR 2851 includes a machine-readable storage medium that stores Cisco's "Communication Manager Express" (formerly "CallManager Express) software instructions ("CME"). The CME controls telephone calls made through the ISR 2851.
route telephone calls in a peer-to-peer fashion over the shared packet network and	The CME routes telephone calls in a peer-to-peer fashion over the shared packet network between CME/ISRs.
to send call log data to the system management platform.	The CME sends call log data to the data collection subsystem of the currently deployed system management platform, e.g. the MIND – M.E.IP.S.

Exhibit B
Linksys

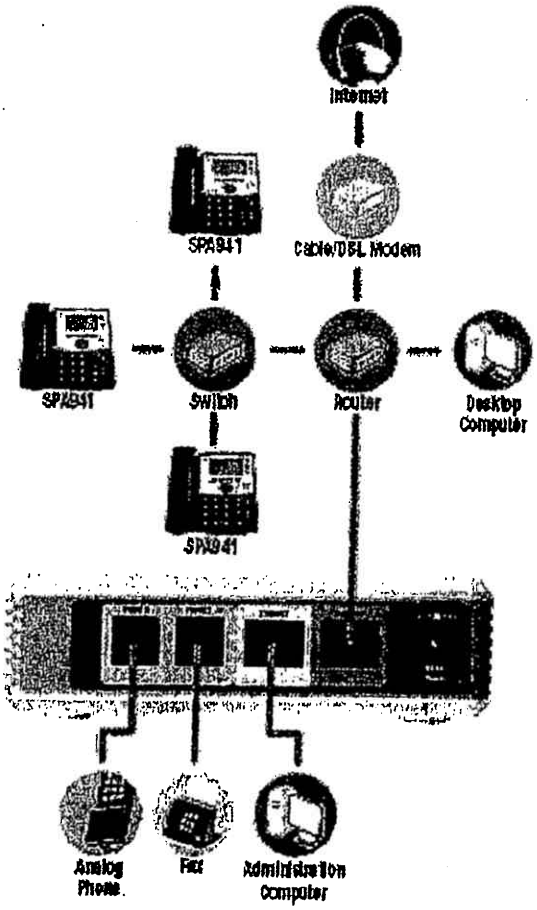


Figure 4-1: A Typical Scenario for the IP Telephony System

Exhibit C
Linksys One

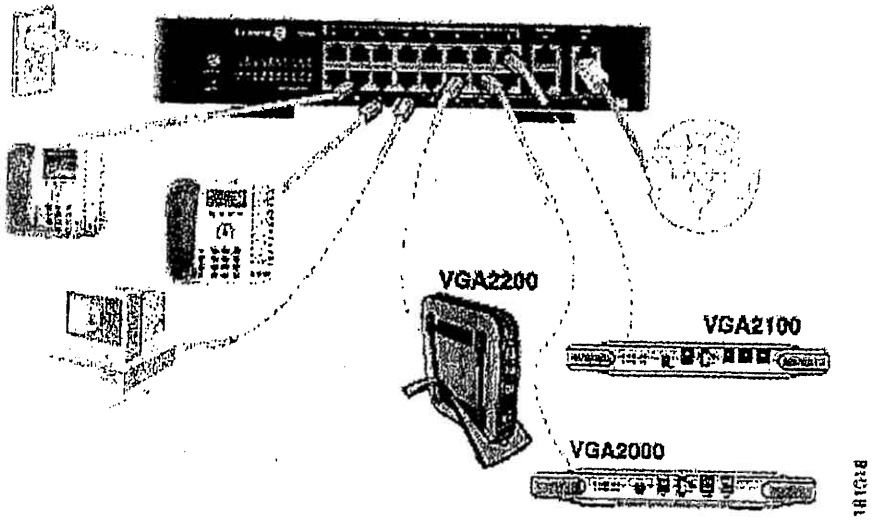


EXHIBIT B

U.S. District Court [LIVE]
Eastern District of TEXAS LIVE (Texarkana)
CIVIL DOCKET FOR CASE #: 5:07-cv-00156-DF-CMC

ESN LLC v. Cisco Systems Inc et al
Assigned to: Judge David Folsom
Referred to: Magistrate Judge Caroline Craven
Cause: 28:1338 Patent Infringement

Date Filed: 10/15/2007
Jury Demand: Plaintiff
Nature of Suit: 830 Patent
Jurisdiction: Federal Question

Plaintiff

ESN LLC

represented by **Eric M. Albritton**
Attorney at Law
PO Box 2649
Longview, TX 75606
903/757-8449
Fax: 19037587397
Email: ema@emafirm.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Thomas John Ward, Jr
WARD & SMITH LAW FIRM
P O Box 1231
Longview, TX 75606-1231
903/757-6400
Fax: 903/7572323
Email: jw@jwfirm.com
ATTORNEY TO BE NOTICED

V.

Defendant

Cisco Systems Inc

Defendant

Cisco-Linksys LLC

Date Filed	#	Docket Text
10/15/2007	1	COMPLAINT against Cisco Systems Inc, Cisco-Linksys LLC (Filing

		fee $ 350 receipt number 1298562.), filed by ESN LLC. (Attachments: # 1 Exhibit A - Part 1# 2 Exhibit A - Part 2# 3 Exhibit B# 4 Exhibit C# 5 Civil Cover Sheet)(Albritton, Eric) (Entered: 10/16/2007)
10/16/2007	2	NOTICE of Attorney Appearance by Thomas John Ward, Jr on behalf of ESN LLC (Ward, Thomas) (Entered: 10/16/2007)

PACER Service Center			
Transaction Receipt			
10/16/2007 09:40:14			
PACER Login:	ws0093	Client Code:	1000.060
Description:	Docket Report	Search Criteria:	5:07-cv-00156-DF-CMC

EXHIBIT C

JS 44 (Rev. 11/04)

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

I. (a) PLAINTIFFS
ESN, LLC

(b) County of Residence of First Listed Plaintiff _____
(EXCEPT IN U.S. PLAINTIFF CASES)

(c) Attorney's (Firm Name, Address, and Telephone Number)
Eric M. Albritton, Albritton Law Firm
P.O. Box 2649, Longview, Texas 75606 (903) 757-8449

DEFENDANTS
CISCO SYSTEMS, INC., and
CISCO-LINKSYS, LLC

County of Residence of First Listed Defendant _____
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED.

Attorneys (If Known)

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

	PTF	DEF		PTF	DEF
Citizen of This State	☐ 1	☐ 1	Incorporated or Principal Place of Business In This State	☐ 4	☐ 4
Citizen of Another State	☐ 2	☐ 2	Incorporated and Principal Place of Business In Another State	☐ 5	☐ 5
Citizen or Subject of a Foreign Country	☐ 3	☐ 3	Foreign Nation	☐ 6	☐ 6

IV. NATURE OF SUIT (Place an "X" in One Box Only)

CONTRACT	TORTS		FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES
☐ 110 Insurance	PERSONAL INJURY	PERSONAL INJURY	☐ 610 Agriculture	☐ 422 Appeal 28 USC 158	☐ 400 State Reapportionment
☐ 120 Marine	☐ 310 Airplane	☐ 362 Personal Injury - Med. Malpractice	☐ 620 Other Food & Drug	☐ 423 Withdrawal 28 USC 157	☐ 410 Antitrust
☐ 130 Miller Act	☐ 315 Airplane Product Liability	☐ 365 Personal Injury - Product Liability	☐ 625 Drug Related Seizure of Property 21 USC 881	PROPERTY RIGHTS	☐ 430 Banks and Banking
☐ 140 Negotiable Instrument	☐ 320 Assault, Libel & Slander	☐ 368 Asbestos Personal Injury Product Liability	☐ 630 Liquor Laws	☐ 820 Copyrights	☐ 450 Commerce
☐ 150 Recovery of Overpayment & Enforcement of Judgment	☐ 330 Federal Employers' Liability	PERSONAL PROPERTY	☐ 640 R.R. & Truck	☒ 830 Patent	☐ 460 Deportation
☐ 151 Medicare Act	☐ 340 Marine	☐ 370 Other Fraud	☐ 650 Airline Regs.	☐ 840 Trademark	☐ 470 Racketeer Influenced and Corrupt Organizations
☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans)	☐ 345 Marine Product Liability	☐ 371 Truth in Lending	☐ 660 Occupational Safety/Health		☐ 480 Consumer Credit
☐ 153 Recovery of Overpayment of Veteran's Benefits	☐ 350 Motor Vehicle	☐ 380 Other Personal Property Damage	☐ 690 Other	LABOR	☐ 490 Cable/Sat TV
☐ 160 Stockholders' Suits	☐ 355 Motor Vehicle Product Liability	☐ 385 Property Damage Product Liability		☐ 710 Fair Labor Standards Act	☐ 810 Selective Service
☐ 190 Other Contract	☐ 360 Other Personal Injury			☐ 720 Labor/Mgmt. Relations	☐ 850 Securities/Commodities/ Exchange
☐ 195 Contract Product Liability				☐ 730 Labor/Mgmt.Reporting & Disclosure Act	☐ 875 Customer Challenge 12 USC 3410
☐ 196 Franchise				☐ 740 Railway Labor Act	☐ 890 Other Statutory Actions
REAL PROPERTY	CIVIL RIGHTS	PRISONER PETITIONS		☐ 790 Other Labor Litigation	☐ 891 Agricultural Acts
☐ 210 Land Condemnation	☐ 441 Voting	☐ 510 Motions to Vacate Sentence		☐ 791 Empl. Ret. Inc. Security Act	☐ 892 Economic Stabilization Act
☐ 220 Foreclosure	☐ 442 Employment	Habeas Corpus:		SOCIAL SECURITY	☐ 893 Environmental Matters
☐ 230 Rent Lease & Ejectment	☐ 443 Housing/ Accommodations	☐ 530 General		☐ 861 HIA (1395ff)	☐ 894 Energy Allocation Act
☐ 240 Torts to Land	☐ 444 Welfare	☐ 535 Death Penalty		☐ 862 Black Lung (923)	☐ 895 Freedom of Information Act
☐ 245 Tort Product Liability	☐ 445 Amer. w/Disabilities - Employment	☐ 540 Mandamus & Other		☐ 863 DIWC/DIWW (405(g))	☐ 900Appeal of Fee Determination Under Equal Access to Justice
☐ 290 All Other Real Property	☐ 446 Amer. w/Disabilities - Other	☐ 550 Civil Rights		☐ 864 SSID Title XVI	☐ 950 Constitutionality of State Statutes
	☐ 440 Other Civil Rights	☐ 555 Prison Condition		☐ 865 RSI (405(g))	
				FEDERAL TAX SUITS	
				☐ 870 Taxes (U.S. Plaintiff or Defendant)	
				☐ 871 IRS—Third Party 26 USC 7609	

V. ORIGIN (Place an "X" in One Box Only)
☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

VI. CAUSE OF ACTION
Cite the U.S. Civil Statute under which you are filing (Do not cite jurisdictional statutes unless diversity):
28 U.S.C. §§ 1331 and 1338(a)
Brief description of cause:
Patent Infringement

VII. REQUESTED IN COMPLAINT: ☐ CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23 DEMAND $ CHECK YES only if demanded in complaint: JURY DEMAND: ☒ Yes ☐ No

VIII. RELATED CASE(S) IF ANY (See instructions) JUDGE _____ DOCKET NUMBER _____

DATE
10/15/2007

SIGNATURE OF ATTORNEY OF RECORD

FOR OFFICE USE ONLY

RECEIPT # _____ AMOUNT _____ APPLYING IFP _____ JUDGE _____ MAG. JUDGE _____

EXHIBIT D

Oct 16, 2007

Patent Office Has Stopped Examining Patents with 25+ Claims

Those of you following your docket through the PTO's PAIR system may note that the Office has begun its 'identification process' of unexamined patents with either (1) more than 25 claims issued or (2) more than 5 independent claims. The docket report shows:

- **Entry**: Flagged for 5/25
- **Status**: "Request for SIR -- Recorded" or "Preexam Flag for 1.75(b) Issues"

According to a telephone conversation with the Office of the Commissioner for Patents, these cases have been pulled from Examiner dockets because they exceed the 5/25 limit and are thus-far unexamined. We will be able to do a retrospective in Mid-November to estimate the number of cases impacted by this pre-rule activity. Of course, this appears to be a *de facto* implementation of the new rules prior to the stated November 1 effective date.

- For an example, look at the PAIR data for App. No. 20060294241.
- Thanks to James McEwen and Randall Svihla alerting me to this issue.
- This alert will help many practitioners ensure that they have found all their cases that exceed the new limits. Many attorneys keep no specific records of the number of claims filed. For published cases, Derwent keeps track of the number of claims.
- UPDATE 10/17/07 — App. No. 20060294241 referenced above is no longer 'flagged.'

In other news:

- CAFC Docket: The CAFC heard 13% fewer cases in FY2007 — freeing their docket for additional BPAI appeals. [LINK]
- Preemptive Strike: In another preemptive strike, on October 15th, ESN sued Cisco for infringing Patent No. 7,283,519. Unfortunately, the patent did not issue until the 16th of October. [Link]

Posted by Dennis Crouch | Permalink

Comments

"Of course, this appears to be a de facto implementation of the new rules prior to the stated November 1 effective date."

Appears to be? What a convenient way to make sure that these applications do not get a first office action prior to November 1st. Hopefully the folks at Kirkland & Ellis can include this *** when they argue for the preliminary injunction.

Posted by: metoo | Oct 16, 2007 at 03:08 PM
I guess this means those silly notices are coming. Why in the world couldn't they just wait for the first RR in the case to complain?

Posted by: me | Oct 16, 2007 at 03:22 PM
Kirkland and Ellis? I hope so too, but the Tafas case supported by Kelley Drye & Warren against the USPTO was the most timely and energetic, preceeding the Kirkland action by almost two months. What took so long? And where is everyone else in this effort to stop a run-away train?

If you review the two actions, you will see that many counts in the Kirkland brief read closely on the Tafas action.

Let's get going before it is too late!!!

Posted by: jwin | Oct 16, 2007 at 04:13 PM
I think bunches of folks are just hoping these go away, but if they don't a bunch of stuff might make it out of the Appeal Board to the Fed. Cir.

Posted by: me | Oct 16, 2007 at 04:23 PM
The Tafas action waived the request for a PI didn't it? Why in the world would they do that? They should re-request the PI with all these changes to the new rules and FAQ's showing that not even the PTO understands them, so how can they be implemented.

Posted by: me | Oct 16, 2007 at 04:24 PM
Interesting; just posted a long reply at http://emgill.blogspot.com/

Thanks for the news.

Posted by: Erin-Michael Gill | Oct 16, 2007 at 04:29 PM
Fun fun fun. I filed an app for a client with well over 25 claims almost 4 years ago (not a business method/software app either). No fewer than 6 examiner changes later, with a search done at the beginning of last year, to date no action from the PTO.

I am sure that the PTO efficiency on this app will increase once those claims get whittled down to 25...

Posted by: zed | Oct 16, 2007 at 04:33 PM
So that's what happened to the case I had on my docket that was a CIP of the case I just sent out a first action on... Damn, I was all set to get an easy count since half the claims were covered by the prior art I already had, now I have to wait for it to come back to me... Hmm... if I pull the case up it still shows my name on it as the examiner, I wonder what will happen if I send out a first action on it anyway?

Posted by: MM | Oct 16, 2007 at 04:41 PM
In thinking about this latest outrageous aspect of the "news rules" situation along with the court actions filed to enjoin enforcement, I have been wondering two more fundamental things. First, what is the basis of the "problem" (backlog) the USPTO is trying to solve? Second, what is the best venue for crafting a true solution to this supposed problem (i.e., a solution that does not destroy American innovation just so examiners can have most Fridays off)?

As to the first question, my colleagues and I think the basis of the backlog is the USPTO's unreasonable restriction practice. In trying to drum up more filing fees the Office started restricting to a ridiculous degree and now it has come back to bite the Office in the... you know. A unity of invention practice more in line with Europe's would solve this problem much better than the new rules.

As to the second question, I fear the only option is the slow, expensive crawl of legislation since the USPTO seems enamored with the new rules it doesn't understand itself.

Just a grass-roots thought.

Posted by: brumjack | Oct 16, 2007 at 04:56 PM
I can fix it. I know the right people. The first year, I would only take a salary to pay the mortgage and bills on my house (I'll get the examiners to feed me because I will be meeting with different groups of them often and ask them to bring apples and other stuff). Make me the Czar (a new position above director and commissioner), complete with sword and tall furry hat. I

can do it. It would be an honor.

Posted by: johng | Oct 16, 2007 at 05:13 PM
Johng, why not just dust off your old stamp (assuming you had one) and fall back into the fold? I'm sure you they wouldn't flog you for a week or two just to show you how much they appreciate you going back. They might even pay you a little more than your mortgage and house bills.
...or is it that you really want the furry hat?

Posted by: anon | Oct 16, 2007 at 05:52 PM
Dennis: Do you know whether, by pulling these applications from the examiners' dockets, that these applications will lose their place in line?

Posted by: anonymous | Oct 16, 2007 at 06:21 PM
the furry hat :)

Posted by: johng | Oct 16, 2007 at 06:46 PM
Today they took all of the cases with more than 25 claims off of my docket. The SPE said they will be assigned to a pool temporarily, and then reassigned when the applicants respond to the postcards with the claims they want to keep. The elected restrictions with more than 25 claims awaiting first actions are still on my "regular amended" docket and the continuations with more than 25 claims awaiting first actions are still on my "special new" docket, although theoretically these are subject to the 5/25 rule as well. Whatever...

Posted by: Dave | Oct 16, 2007 at 09:26 PM
As this Kafka-esque experience continues to unfold, the open road starts to sound better all the time: http://www.drivebigtrucks.com/

Posted by: C. Springer | Oct 16, 2007 at 09:28 PM
Thanks for the notice...yup, they pulled one of mine, too...which my examiner had a good shot of getting to before 11/1.

Time travel (ie speeding things up) is evidently not a problem for PTO management...when it suits them.

Just one more way of saying "go to h*ll" to us pro se folks.

Damn these people.

Posted by: Steve | Oct 16, 2007 at 11:25 PM
I've just gone through my US docket. Two of my cases have been pulled and now show status as "Preexam Flag for 1.75(b) Issues". (Each has 3 independents and 26-30 total claims.) I have two more that break the 5/25 rule but haven't yet been yanked ... although I'm expecting that to change any day now.

Posted by: CliveFenster | Oct 16, 2007 at 11:33 PM
BTW, my two have been pending for 1.5-2.5 years in TC1700. Based on past experience, the young one was on the brink of an Action, and I'm surprised the older one hadn't already gotten one.

At least I can just drop a claim and get it rolling again. I plan to phone the Examiner tomorrow, and will report back if a flagged application loses its place in the queue.

Posted by: CliveFenster | Oct 16, 2007 at 11:36 PM
It wouldn't matter whether a practitioner kept records of number of independent and dependent claims filed. Rule 37 CFR 1.75(b)(2) recharacterizes certain previously "dependent" claims as "independent." For each case, the number of independent claims will need to be re-counted. A colleague of mine is developing some software to automate the task of re-counting, by flagging those previously-dependent-for-fee-purpose claims that would be recharacterized by the new regs. If interested in seeing a beta copy, send email to information@elman.com.

Posted by: Gerry Elman | Oct 17, 2007 at 07:24 AM
Roughly 30% of the cases I have pending have been flagged (I use partridge to monitor the status our apps). That differs significantly from the patent office's estimate that less than 10% of the applications will be affected.

Anyone else have such a high number flagged?

Posted by: Antonio | Oct 17, 2007 at 09:33 AM
I have a question for all of you smart folks - I think it's actually related, as well. What impact is the 5/25 rule going to have on patent term adjustment? If I have a pending case as of Nov. 1 with more than 25 claims, am I failing "to engage in reasonable efforts to conclude prosecution" as of November 1? (Quoting 37 CFR 1.704.) Does any PTA get reduced by the number of days from Nov. 1 until the claim count is reduced or an ESD is filed? Or by the number of days from mailing of a notice of non-compliance until I reduce the claim count?

Thoughts?

Posted by: joefrank | Oct 17, 2007 at 09:55 AM
Gerry, for my pending US spreadsheet: I withstood the tedium of re-counting my independents based on the new way of categorizing them.

Posted by: CliveFenster | Oct 17, 2007 at 10:17 AM
"Does any PTA get reduced by the number of days from Nov. 1 until the claim count is reduced or an ESD is filed? Or by the number of days from mailing of a notice of non-compliance until I reduce the claim count?

Thoughts?"

Apparently new Rule 704(c)(11) only applies to cases filed on or after Nov. 1. From FR 46716:

"The changes to 37 CFR 1.78(a), 1.78(d)(1), 1.495 and 1.704(c)(11) are applicable only to any application, including any continuing application, filed under 35 U.S.C. 111(a) on or after November 1, 2007, or any application entering the national stage after compliance with 35 U.S.C. 371 on or after November 1, 2007."

For cases filed on or after Nov. 1, it appears that all you need to do is file an SRR in compliance with Rule 142 when you file your application containing more than 5/25 claims and you will completely avoid the penalties of new Rule 704(c)(11), regardless of whether the Examiner accepts it or not. (This is question 20 of the NIPRA quiz linked at http://www.nipra.org/action.html. Talk about arbitrary and capricious.)

New Rule 704(c)(11) says:

(11) Failure to comply with § 1.75(b), in which case the period of adjustment set forth in § 1.703 shall be reduced by the number of days, if any, beginning on the day after the date that is the later of the filing date of the amendment resulting in the non-compliance with § 1.75(b), or four months from the filing date of the application in an application under 35 U.S.C. 111(a) or from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) in an application which entered the national stage from an international application after compliance with 35 U.S.C. 371, and ending on the date that an examination support document in compliance with § 1.265, an election in reply to a requirement under § 1.142(a), 1.146 or 1.499 resulting in compliance with § 1.75(b), an amendment resulting in compliance with § 1.75(b), or a suggested restriction requirement in compliance with § 1.142(c), was filed;

Note that Rule 75(b) can sneak up on you if you have previously filed related cases (with claims the USPTO will consider indistinct), so filing an SRR even in cases that don't exceed 5/25 themselves may be advisable to defang Rule 704.

Posted by: real anonymous | Oct 17, 2007 at 10:29 AM
David French writes:

"...what is the basis of the "problem" (backlog) the USPTO is trying to solve? Second, what is the best venue for crafting a true solution to this supposed problem (i.e., a solution that does not destroy American innovation just so examiners can have most Fridays off)?"

The central "problem" is that the examination staff is not processing applications fast enough to keep up. I imagine if you ask the examiners why this is true, they will complain about two things: 1) too many claims in patent applications, and 2) to many citations of prior art. Management has seized on the issue of "too many applications" blaming continuation practice.

I have had examiners complained to me about the number of claims in other applications they are reviewing. I have also seen patents, e.g. a snowstop rail for a roof edge, with over 60 claims six or seven of which were independent. It doesn't take much thought to realize that such patents, once asserted, can be leveraged into an early settlement because of the substantial costs of making even an initial analysis.

Regarding the citation of prior art, we have all seen patents with seemingly endless strings of references. Such patents are also well-positioned to precipitate early settlement discussions. And the filing attorneys know this.

Harry Moatz's concerns reviewed in the Patently-O blog of October 15, 2007 that "Attorneys and agents have a duty of inquiry to ensure that all assertions made to the office must be "legally warranted" and not made for an "improper purpose."" and "Practitioners must read each and every paper submitted to the office in its entirety" may understandably have arisen from examiner objections to the number of prior art references being poured into the record by applicants.

The solution? While not a perfect solution, the USPTO should seriously investigate implementing a system of deferred examination.

Not everyone wants a patent to be granted promptly. Many agents and attorneys want to see patents prosecuted because this is how they make their living. But many applicants in the-the-know would probably elect to have examination of their applications deferred until they find out whether the technology is going to go anywhere.

There are other possible approaches to dealing with excessive claims and excessive prior art citations, but these can be reviewed on a later occasion.

Posted by: David J. French | Oct 17, 2007 at 10:53 AM
True defferred examination would be a plus for all, particularly in light of the coming "fist to file" system which will drive early filings where the client is unsure of the technologies utility or place in the market.

Posted by: me | Oct 17, 2007 at 11:11 AM
Fit of paranoia here. If I decide to preemptively (well before any FAOM) cancel a small handful of less important dependent claims to get back inside the 5/25 box and not lose my place in the queue ... would those cancellations be construed as having been made for reasons relating to patentability?

Posted by: CliveFenster | Oct 17, 2007 at 11:13 AM
One of mine has been flagged as well. The "First Office Action" prediction tab in private PAIR has also disappeared

Posted by: Mark Nowotarski | Oct 17, 2007 at 11:18 AM
Thanks, real anonymous.

So, it appears that Rule 704 doesn't expressly address the situation where I have a case filed before Nov. 1 with more than 5/25 claims (and which hasn't received an action on the merits). It's interesting that the rule gives a 4-month grace period for new applications. Can we assume that there's a 4-month grace period for existing applications, or do we assume the worst - that I'm forfeiting PTA day-for-day if I delay filing an amendment beyond Nov. 1? Am I right that there's nothing in the rules or statutes to govern this situation other than the general Rule 704 requirement that I engage in "reasonable efforts" to advance prosecution.

You raised another issue that makes me nervous as well. I'm already concerned about the "indistinct claims" weapon that the new rules have created. Are you suggesting that if an Examiner makes an unfounded assertion that my client's two applications include indistinct claims, then I immediately start forfeiting PTA? Wow... Your suggested remedy, filing a SRR in every case, is interesting, as it would indeed seem to eliminate the PTA reduction of 704(c)(11). But that's crazy...

Posted by: joefrank | Oct 17, 2007 at 11:24 AM
CliveFenster wrote, "I plan to phone the Examiner tomorrow, and will report back if a flagged application loses its place in the queue."

Did you get an answer?

Posted by: anonymous | Oct 17, 2007 at 11:35 AM
Joefrank, I think new Rule 704(c)(11) does not apply to your pending case (see the applicable date in the FR notice). Old Rule 704(c)(11) applies instead which deals with continuations, not ESDs/claim limits.

I think they made a mistake and called the new rule (c)(11) when they might have meant (c)(12). If they really do eliminate old (c)(11), you may be able to file continuations and keep your accrued PTAs from parent cases, but I'm not sure.

Posted by: real anonymous | Oct 17, 2007 at 11:42 AM
For the applications that have been pulled – you will not "loose your place in the backlog"!!!! Everyone seems to be freaking out about this, but if you understood Examiner's workflow and how dockets are managed at the Office you wouldn't be in such a tizzy. As soon as the 5/25 requirements have been met, the application will be placed back on the Examiner's docket. Examiner's docket's list "regular new" cases and "special new" cases in chronological order and Examiners earn workflow credits for completing an "oldest new" application each bi-week. Therefore, when each application is placed back on the Examiner's docket it is placed right back in the same order as it was pulled from.

Example: You filed your application on 01/01/05. As of 10/01/07 it was the third case down on my docket list of new cases and on 10/15/07 it was pulled for not complying with the 5/25 rule. Applicant promptly takes care of the issue on 12/15/2007 and the case is placed back on my docket as the FIRST or SECOND case listed in my list of new cases, depending of course, if I've completed the other two cases that were before it on my list before the pull date in October.

Every body take a deep breath and chill.

Posted by: Jessica | Oct 17, 2007 at 12:10 PM
Anonymous: the (unofficial) response I got matches what Jessica said.

Posted by: CliveFenster | Oct 17, 2007 at 12:16 PM
I think things are getting a bit out of control here. I authorized an Examiner a week ago regarding a restriction requirement and elected a group that reduced the number of claims to less than 25. The case was pulled from the Examiner- he does not have access to it anymore.

Posted by: JN | Oct 17, 2007 at 12:33 PM
All should file an interpleder action and join GSK on this point alone. Remember that patent term is measured from the priority. Any extra time required to satisfy the 5/25 threshold reduces the term. Please note that they have defacto and ex post facto reduced the term of the patent. In short, the USPOT can use this entire situation to make their backlog look good because for each response to the 1.75(b) notice the upwardly adjustment is downwardly reduced. Taken over 100,000s of patent applications this can be centuries of time . . . time that the USPTO can now not beembarrassed by because of this new trickery to reduce the upward adjustment. This is a taking pure and simple. Just imagine the value of the upwardly term adjustment taken by the USPTO over the totality of patent applications effected. I could approach a trillion dollars. In effect, the USPTO is in the process of eviscerating billions of dollars of tax money that would rightly have to be paid were the upwardly adjustment not reduced by the 1.78 showing.
Is everyone now seeing how efficiency is improved . . . real efficiency is not improved only the appearance of inefficiency . . . inefficiency that would be manifest were the USPTO not allowed to reduce the upwardly PTA by this new chess rule. Personally, I would like the entire world to see the level of efficiency of the Bush controlled USPTO.
You want to know how insidious I believe this is . . . I think there should be investigated whether the upper management of the USPTO deliberately destroyed the efficiency of the USPTO and is now trying to cover-up the inefficiency.

Posted by: fromthedarkplaces | Oct 17, 2007 at 01:07 PM
I generally keep within the 20/3, but sometimes clients want extra claims. Occasionally, it has even been justified by the nature of the invention.

If I file a preliminary amendment in cases with lots of claims and cancel excess claims, can I get a refund of the extra claim fees? If so, how?

Posted by: Dr. Michael Factor | Oct 17, 2007 at 01:14 PM
I doubt it Dr. Factor. They never refund money after a restriction or when you cancel by way of a preliminary amendment not filed with the application. Consider it another "takings" by the PTO.

Posted by: johng | Oct 17, 2007 at 01:43 PM
Check out Rule 1.26, Refunds, and 1.117, Refund due to cancellation of claim. I'm slogging through them now. Little consolation for my clients that the refunded fees mostly likely will not even cover my fees for the preliminary amendment.

Posted by: Tom Kulaga | Oct 17, 2007 at 01:53 PM
It looks like the 5/25 flag has been withdrawn from that application now. Any idea what's up?

Posted by: PJ | Oct 17, 2007 at 02:02 PM
The other day, I talked by telephone to an examiner who has misunderstood the new rules and has stopped working on ALL applications that have more than 25 claims, even applications that already have a final rejection.

Posted by: Monster Movie | Oct 17, 2007 at 02:03 PM
Tom is right. I was not aware of this newly proposed rule directed specifically to this situation. See pages 46739-46740 of the FR.

Posted by: johng | Oct 17, 2007 at 02:20 PM
Dr. Factor,

I spoke with someone at the Office of Patent Legal Administration earlier today and she indicated that the provisions of the Consolidated Appropriations Act 2005 have been extended (see HJ Res. 52 Sec 117). Interestingly, the extension appears to expire on Nov. 16, 2007. At least until that time you should be able to request a refund for excess claims fees paid on or after Dec. 8, 2004 (under 1.117(a)), as long as the refund request is filed within two months of canceling the claims. I just finished drafting a refund request letter.

Posted by: NorthoftheBorder | Oct 17, 2007 at 02:24 PM
CliveFenster wrote:

"If I decide to preemptively (well before any FAOM) cancel a small handful of less important dependent claims to get back inside the 5/25 box and not lose my place in the queue ... would those cancellations be construed as having been made for reasons relating to patentability?"

We are including in a preliminary amendment 'Remarks' the following :

" Applicants have amended the claims to conform to the requirements of 37 C.F.R. § 1.75(b). "

Any comments?

Posted by: Matt K. | Oct 17, 2007 at 02:25 PM
In case you have not noticed the "flag" has been miraculously "unflagged" in published application 20060294241. I hope all flags will now be removed.

Posted by: Abe Hershkovitz | Oct 17, 2007 at 02:32 PM
woo hoo! the flags are gone! oh wait...I'm not really sure that should make anyone feel better

Posted by: metoo | Oct 17, 2007 at 02:36 PM
Matt & Clive,

"... would those cancellations be construed as having been made for reasons relating to patentability?"

If you're only cancelling dependent claims to get within the 5/25 limit, I can't imagine how this could be construed as "relating to patentability." In any case, if we're worried about estoppel under Festo, I believe that Festo is about narrowing amemdments. It's possible that canceling a parent claim can be construed as a narrowing amendment, but it would be difficult for the cancellation of a minor dependent claim to be narrowing.

Posted by: joefrank | Oct 17, 2007 at 02:41 PM
Matt K, my plan was to not state that the claims were being canceled to place the application in conformance with Rule 75. Rather, I thought I'd just write that claims X-Y were canceled without prejudice to their introduction into the present or other application.

Yeah, I could you could get me to admit in a deposition that I was motivated by the 5/25 rule. But at least equally, I reviewed at the claims (prompted by the pending 5/25 rule) with a critical eye, looking to see if I really needed every claim I'd initially filed and whether canceling some might make the Examiner's job a little easier (a self-serving result for me).

Posted by: CliveFenster | Oct 17, 2007 at 02:45 PM
That's "I *guess* you could get me ..."

Ooops.

Posted by: CliveFenster | Oct 17, 2007 at 02:48 PM
I have an application that's available through Public PAIR, 10/405,149, filed April 2, 2003, in which I noticed this "flagged" status this morning.

As for an applicant's right to file patently "indistinct" claims, unless claims are of "identical" scope, the PTO's only recourse is to issue an obviousness-type double patenting rejection if the patently indistinct claims are in different applications or patents, which can be overcome by a terminal disclaimer.

Further, having paid the additional claims fees mandated by statute, and the PTO having accepted those fees, it cannot, in any event, refuse to examine claims it previously agreed to examine; the PTO's additional claims fee structure, by statute, compensates the PTO for the additional workload.

Finally, earlier today, the District Court in Alexandria, Virginia, affirmed that the preliminary injunction hearing on GlaxoSmithKline's motion for a TRO/preliminary injunction will be held, as scheduled, on October 26th. The PTO had first agreed to this hearing date, but, after seeing GSK's arguments, wanted a delay, apparently unable to defend the legal validity of its own Rules. More specifically, the DOJ complained that it was overwhelmed by the papers filed by GSK, a private party. As it is, the Rule changes were deliberately written, in 129-page maze in the Federal Register, in a manner that made it difficult for any sane person to understand and thereby challenge. With the PTO's "flagged" status today, it would seem that most patent attorneys now have at least one client with "standing" to challenge at least a portion of the Rule changes.

I would be very surprised if the PTO's Rule changes actually went into effect November 1, 2007, notwithstanding the arrogant pronoucement on its home page that the Rule changes for continuations and claims "will take effect" on November 1. I expect that either the District Court or CAFC will act to prevent the train from being wrecked!

Posted by: Edwin D. Schindler | Oct 17, 2007 at 02:56 PM
My "flags" are all still very firmly in place. The Office seems to be flagging those applications with a first office action likely in the next few months (such as my cases for which an action was previously predicted in 1-3 months). Interestingly, my case with a first action predicted in 97 months has not been flagged!!

Posted by: NorthoftheBorder | Oct 17, 2007 at 02:59 PM
You mean they only removed the flag from the one posted above? Ha ha ha. How Bush-league!

Posted by: wiseguy | Oct 17, 2007 at 03:23 PM
Am I correct in assuming that Festo was the beginning of the end our U.S. patent system as we knew it back then? Hindsight is 20/20 – that's when we should have started to fight back.

Under our Constitution, changes of the Festo nature and beyond can only properly come about as a result of legislation, or am I missing something?

Excerpts below from this link:

http://scientific.thomson.com/free/ipmatters/iplr/8179973/

"Festo under the spotlight
Festo was a case that held the attention of a constituency comprising not only lawyers but also boardrooms, investors and analysts across the entire world. The fact was that anyone who owned a US patent or had invested in a company that owned a US patent needed to know about Festo and its possible implications.
In Festo, the Supreme Court was asked to decide whether to uphold the ruling of the US's specialist patent court - the Court of Appeals for the Federal Circuit (CAFC) - that the scope for patent owners to allege infringement of their rights under the doctrine of equivalents should be significantly reduced."

<>

The question for today is: "How long will the U.S. exist as we know it?"

I am thinking 2011...

unless we demand Impeachment before it is too late, or unless Mike Bloomberg is elected.

Best regards,

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 03:29 PM
Edwin D. Schindler -- your comments, which I have copied below, make sense to me. Does anyone disagree???

--As for an applicant's right to file patently "indistinct" claims, unless claims are of "identical" scope, the PTO's only recourse is to issue an obviousness-type double patenting rejection if the patently indistinct claims are in different applications or patents, which can be overcome by a terminal disclaimer.

Further, having paid the additional claims fees mandated by statute, and the PTO having accepted those fees, it cannot, in any event, refuse to examine claims it previously agreed to examine; the PTO's additional claims fee structure, by statute, compensates the PTO for the additional workload. --

Posted by: Curious | Oct 17, 2007 at 03:34 PM
On an unrelated note, in Pub. No. 20060294241 (the one for which the flag was mysteriously removed), I wonder if the attorney read every page of the references submitted with the IDS - they appear to total about 1500 pages (for the 3 references)

Posted by: metoo | Oct 17, 2007 at 03:38 PM
"Supreme Court was asked to decide whether to uphold the ruling of the US's specialist patent court - the Court of Appeals for the Federal Circuit (CAFC) - that the scope for patent owners to allege infringement of their rights under the doctrine of equivalents should be significantly reduced."

The question for today is: "How long will the U.S. exist as we know it?" I am thinking 2011...unless we demand Impeachment before it is too late, or unless Mike Bloomberg is elected."

It's already too late. The SCOTUS has already been packed, damage done.

Posted by: bierbelly | Oct 17, 2007 at 03:51 PM
And just as soon as the flags appeared, they were withdrawn and the cases were put right back in my docket as if nothing happened, with PALM code W525 "WITHDRAW FLAGGED FOR 5/25". Weird.

Posted by: examiner | Oct 17, 2007 at 03:57 PM
Dear bierbelly,

"It's already too late. The SCOTUS has already been packed, damage done."

Cannot one or more of Supreme be impeached?

manhattanbelly,
a/k/a

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 04:01 PM
"Am I correct in assuming that Festo was the beginning of the end our U.S. patent system as we knew it back then?"

No. Markman and Festo were the beginnings of a robust patent system that wasn't a complete joke.

Posted by: Malcolm Mooney | Oct 17, 2007 at 04:05 PM
They sure can be impeached - and the frequency with which Supreme Court justices have been impeached is indicative of the likelihood of it happening any time soon. In other words, ROFL - good luck!

Posted by: metoo | Oct 17, 2007 at 04:08 PM
"In case you have not noticed the "flag" has been miraculously "unflagged" in published application 20060294241. I hope all flags will now be removed"

It was removed, because of my earlier post. It is evidence of which judicial notice may be taken that would support GSK's takings argument. See my post above.

Posted by: fromthedarkplaces | Oct 17, 2007 at 04:09 PM
My flags are gone too. First office action predictions are back up.

Posted by: Mark Nowotarski | Oct 17, 2007 at 04:12 PM

Hello Malcolm,

Thanks for your comment. I always enjoy your jokes.

PS: I guess we know where your bread is buttered.

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 04:18 PM
I would be interested to know the first office prediction for some of the applications that have had the flags removed. Mine have not changed.

Posted by: NorthoftheBorder | Oct 17, 2007 at 04:19 PM
PREDICTION. The USPTO will be CRUSHED by GSK. I don't even think it will be close. I just hope the courts ruling does not totally eviscerate the executive agencies' powers. I mean Judge Hilton is a Reagan appointee. Remember Ronnie's quotes "I want to abolish the department of energy and education." Not a real friendly guy to executive agencies. Well Judge Hilton, I hope that you remeber the defender of freedom and the man who defeated communism without firing too many shots when you make your ruling.

Posted by: fromthedarkplaces | Oct 17, 2007 at 04:21 PM
Dear metoo,

"They sure can be impeached - and the frequency with which Supreme Court justices have been impeached is indicative of the likelihood of it happening any time soon. In other words, ROFL - good luck!"

Maybe if we lope off just one head (via impeachment), the rest will catch the drift? One step at a time is better than standing still for this affront.

PS: I'm a little new to this, what is ROFL?

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 04:27 PM
Methinks that the USPTO proved Tafas and GSK's cases; a temporary taking is still a taking. Irreparable harm has already occurred. If you follow their actions, it is clear the USPTO is

scrambling; revised guidance,threats by OED, flagged and unflagged status within a day; OMB criticism about planning. All we need is a sex scandel and the who situation will be worthy of a movie script.

Posted by: X-Solo | Oct 17, 2007 at 04:28 PM
ROFL = rolling on the floor laughing....and my apologies for using it, as I did not intend it as a personal criticism.

As for impeachment, it has happened only once in US history - Samuel Chase was impeached by the House, but acquitted by the Senate (and therefore remained on the bench).

Posted by: metoo | Oct 17, 2007 at 04:34 PM
Oh boy this is great!

Posted by: Kent Dorfman | Oct 17, 2007 at 04:38 PM
I have a case whose status states "Non Final Action Counted, Not Yet Mailed" where the non final action was written 4 days prior to the mysterious 5/25 flag appeared (10/12 vs/ 10/16). I will surely be monitoring this one.

Posted by: Reno | Oct 17, 2007 at 04:45 PM
Dear metoo,

Thank you for your kind comment and edification.

Well then, we have the rare opportunity to make history. I don't mean to only joke - - Something Must Be Done!, before we all go to hell in a hen basket or worse. I'm only an ordinary inventor, I cannot do it alone. It will take a team effort. R U with me on this 4 COL ...

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 04:49 PM
Some tidbits from briefing in the GSK lawsuit.
From the PTO's unsuccessful request (i.e., whining) to delay the hearing on the PI motion:
"Plaintiffs left the USPTO with merely eight (8) days to file their opposition to the motion, even though (1) the Final Rules implicate extremely complex issues of patent prosecution procedure; (2) the Motion contains hundreds' of pages of exhibits, including an extra legal brief masquerading as an exhibit;2 and (3) the Motion requires the USPTO to investigate highly technical patent applications in order to assess the validity of Plaintiffs' allegations of "irreparable harm," standing, and ripeness."

GSK's response:
"the Defendants already understand the "extremely complex issues of patent prosecution procedure" implicated by the Final Rules—they wrote them."

and

"The Defendants apparently did not mind that these new rules, which exceed their rulemaking authority, will retroactively affect thousands of pending patent applications, or that they force applicants such as GSK to read, comprehend, and attempt to reorganize their business activities to comply with this sea-change in a mere two months. Thus, it strains credulity that the Defendants now argue that they do not have a sufficient amount of time to respond to an emergency challenge to these rules. In short, the Defendants' unreasonable effective date caused this situation. If Defendants require more time to respond, they should agree to postpone the effective date of the Final Rules."

and

"The Defendants give no cogent reason why they need more time, other than making the conclusory assertion that GSK's motion is "massive" (Docket # 17, Emergency Motion at 1). Most of that "mass" is actually the text of the Final Rules which the Defendants wrote and an exemplar patent (Docket # 14, Exhibit A; Docket # 15, Exhibit B-1)."

How pathetic.

Posted by: metoo | Oct 17, 2007 at 04:56 PM
Is Margaret Peterlin handling the case for the PTO?

Posted by: wiseguy | Oct 17, 2007 at 05:06 PM
USPTO whining:

"5. By noticing the hearing on their Motion for Friday, October 26, Plaintiffs left the USPTO with merely eight (8) days to file their opposition to the motion, even though (1) the Final Rules implicate extremely complex issues of patent prosecution procedure; (2) the Motion contains hundreds' of pages of exhibits, including an extra legal brief masquerading as an exhibit; and (3) the Motion requires the USPTO to investigate highly technical patent 2 applications in order to assess the validity of Plaintiffs' allegations of "irreparable harm," standing, and ripeness.

6. Pursuant to Local Civil Rule 7(F)(1), a party opposing a motion is entitled to eleven (11) days to respond to that motion. Federal Rule of Civil Procedure 6(e) augments that time by an additional three (3) days. Thus, under the applicable rules, the USPTO is entitled to fourteen (14) days -- or until October 29, 2007 -- to respond to Plaintiffs' Motion."

Can USPTO lawyers count?

"Friday, October 26" : "merely eight (8) days"

"[T]he USPTO is entitled to fourteen (14) days -- or until October 29, 2007"

What if they do this sort of counting with our claims??

Posted by: real anonymous | Oct 17, 2007 at 05:22 PM
If I may . . . let me succinctly translate GSK's response to the USPTO's whining . . . "tough Shit. You wrote this cr@p now deal with it."

Posted by: fromthedarkplaces | Oct 17, 2007 at 05:28 PM
"PS: I guess we know where your bread is buttered."

Yeah, it's buttered on the side of the average person that doesn't go around beating people over the head with crap patents. You know: the same side that 99% of Americans butter their bread.

You really are an "ordinary inventor", in the most literal sense of that term.

Posted by: Malcolm Mooney | Oct 17, 2007 at 05:29 PM
One more thing, Mr. Ordinary: I think the new rules stink and I hope that GSK's suit manages to delay their implementation for a long time, if not indefinitely.

On the other hand, the old rules were being abused to the detriment of every citizen except entities so wealthy and legally well-armed that they are immune from harm in the practical sense.

Of course, the Reaganites and their neocon offspring would argue that what's good for those entities is good for every man, woman, and child in the US.

Not all of us are so braindead, thankfully.

Posted by: Malcolm Mooney | Oct 17, 2007 at 05:36 PM
Besides the PTO itself, is there anyone that has commented favorably on the new rules?

Posted by: metoo | Oct 17, 2007 at 05:48 PM
"What if they do this sort of counting with our claims??"

If I understand it properly, Local Rule 7 and FRCP 6 each measures in calendar days; USPTO was whining in business days.

Which means the difference between 26OCT and 29OCT is either six days, three days, or one day, depending on how you count.

Posted by: CliveFenster | Oct 17, 2007 at 05:49 PM
Dear Malcolm,

"On the other hand, the old rules were being abused to the detriment of every citizen except entities so wealthy and legally well-armed that they are immune from harm in the practical sense."

Yes, to some limited extent I agree (surprised?), and the abuses under the old rules should have been and were being curtailed (as did, e.g., Fish & Neave in Nevada when they shutdown Lemelson).

That was the remedy all right, not the hyperBS that has been and is being foisted on us faithful practitioners of the legal arts and (in my case) the ordinary inventing arts.

Posted by: Just an ordinary inventor(TM) | Oct 17, 2007 at 05:50 PM
"Which means the difference between 26OCT and 29OCT is either six days, three days, or one day, depending on how you count."

Well, thank you for the clarification... I think. :-)

Posted by: real anonymous | Oct 17, 2007 at 05:53 PM
While I've been around too long to ever take anything for granted in litigation, particularly patent litigation, I am optimistic with respect to GSK's lawsuit (including the PI motion). Hopefully, my gut feeling is correct. If so, I also wonder if the GSK case will eventually make it to this page: http://www.vaed.uscourts.gov/notablecases/index.html Now that would be a nice irony given the other cases currently listed

Posted by: metoo | Oct 17, 2007 at 06:12 PM
One last thing, Gene Quinn and John White over at PLI have put out a "call to arms" for those willing to join GSK in the good fight. Since many companies and firms are likely hesitant to put their name out front, Gene is suggesting that anyone with one or more arguments suitable for an amicus brief send the material to him ASAP. Even if you are unable to lend your name, you can help in the cause. Link to PLI's blog site site: http://www.pli.edu/patentcenter/default.asp

Posted by: metoo | Oct 17, 2007 at 06:21 PM
Has anyone ever successfully sued the PTO to stop a set of rules from going into effect?

I don't think so.

And, so, I don't forsee that GSK will succeed where others failed.

Posted by: George | Oct 17, 2007 at 06:31 PM
I can understand the uproar by all of the outside patent attorneys over the new rules, but as an examiner I can tell you that we have been practicing our own version of the 5/25 rule for awhile - - i.e. if an examiner's docket is loaded with new cases (and in light of the production quota system), cases with over about 30 claims tend to sink to the bottom of an examiner's docket and stay there until their SPE is beating down the door for the Office Action (this doesn't happen much), or negative workflow starts to kick in, or there just aren't any other cases on the docket to work on. I'm sure the statistics on this (pendency versus the number of claims in a given application) would confirm my point.

Posted by: anon examiner | Oct 17, 2007 at 06:33 PM
"i.e. if an examiner's docket is loaded with new cases (and in light of the production quota system), cases with over about 30 claims tend to sink to the bottom of an examiner's docket and stay there until their SPE is beating down the door for the Office Action"

No surprises there! We can all relate.

Posted by: Malcolm Mooney | Oct 17, 2007 at 06:43 PM
anon examiner: "i.e. if an examiner's docket is loaded with new cases (and in light of the production quota system), cases with over about 30 claims tend to sink to the bottom of an examiner's docket and stay there until their SPE is beating down the door for the Office Action (this doesn't happen much),"

Has the PTO eliminated the "date case in the Art Unit" standard for moving cases that existed when I was there (admittedly a long time ago)?

Posted by: Alan McDonald | Oct 17, 2007 at 06:59 PM
I have 3 cases that now have the flag for 5/25 withdrawn -- I've reviewed the claims in each, and would be unsurprised to get a restriction in all of those. It may be that they're filtering them for restrictable claims.

Of the ones that the flag was NOT withdrawn, I notice that one says a FOAM was just mailed yesterday, the same day it was flagged.

Posted by: Matt | Oct 17, 2007 at 07:01 PM
"Has anyone ever successfully sued the PTO to stop a set of rules from going into effect?"

Interesting question. Has anyone every sued the PTO to stop a set of rules period?

Posted by: Mark Nowotarski | Oct 17, 2007 at 07:05 PM
"Besides the PTO itself, is there anyone that has commented favorably on the new rules?"

Intel commented favorably on the rules as they were originally proposed, along with others in the software electronics industry.

The DOJ also commented favorably.

Posted by: Mark Nowotarski | Oct 17, 2007 at 07:08 PM
NIPRA sued Rogan twice to make him follow AIPA (both suits were settled, one after Rogan was force to withdraw a presumably false "certification" he made to Congress). The filings (and settlement stipulations) from the suits are still posted at:

http://www.nipra.org/index.htm

Posted by: real anonymous | Oct 17, 2007 at 07:11 PM
Malcolm,

I am surprised you would defend Markman. Festo was overrated, but Markman essentially means claim interpretation is incomplete until the CAFC determination.

Claim interpretation is a matter of fact. And I would rather have a jury that may contain an engineer or two interpreting claim language than a judge with no technical background.

Posted by: Lionel Hutz | Oct 17, 2007 at 07:31 PM
"Claim interpretation is a matter of fact. And I would rather have a jury that may contain an engineer or two interpreting claim language than a judge with no technical background."

That's priceless, Lionel. You've outdone yourself.

For the most part, judges do a decent job on claim construction. That said, there is still a shocking number of them who "don't get it." Of course, that's not entirely their fault. Behind every crappy claim construction is an crappier brief written by attorneys who should probably be sanctioned for their misrepresentations of the law and facts.

Posted by: Malcolm Mooney | Oct 17, 2007 at 07:40 PM
Malcolm,

Based upon our past exchanges, I have no idea whether you are being sarcastic and if so, about what.

However, if your first sentence was genuine, then thanks, but I do not believe I said anything particularly profound.

Ideally, I would rather see every district court assigned a "patent" judge or judges that are technically trained. I would prefer my claims interpreted by such judges. However, for better or for worse, I do believe claim interpretation is primarily factual and if a party wants a jury, they should be able to have it.

Posted by: Lionel Hutz | Oct 17, 2007 at 07:49 PM
"Claim interpretation is a matter of fact. And I would rather have a jury that may contain an engineer or two interpreting claim language than a judge with no technical background."

To start with, no fewer than 5 of the current Federal Circuit judges have technical backgrounds, including 2 PhDs. Besides, if you're so worried about the court getting the claim construction wrong, then why don't you define the claim language in the specification as you're allowed to do so???

Posted by: anon | Oct 17, 2007 at 07:50 PM
I agree with Mr. Lionel in so much as claim interpretation should be a question of fact decided by a jury. However, the courts are mindful of the Doctrine of Jury Nullification which was incorporated to American jurisprudence vis-a-vis the 7th Amendment. Were claims interpreted by a jury, they could use the Doctrine of Jury Nullification to award affable patent holder and punish a recalcitrant patent holder. Could you imagine if the Doctrine of Jury Nullification was properly used in the Copyright infringement trial brought by RIAA?

Posted by: fromthedarkplaces | Oct 17, 2007 at 07:51 PM
Gentlemen, now really.... Examiners have simply stopped working on cases that had more than 25 claims some time ago. In fact, our SPEs told us to do so (as if we didn't already know). As far as the Zero Inventory Date cases, it's no bright line rule.

Lets see - I've got a docket of 120 cases (40 of which are new). I can easily get by without working on 10 new cases that have over 25 claims. Oh well.

I do have to say, however, that the PTO's actions have disturbed me here. I have some friends that were actually working on cases with over 25 claims (some of them EVEN COMPLETED, but not counted); but - these cases were pulled right out form our dockets!

I think that a VERY pertinent point was made above. If you file two cases with 20 claims each that are indentical, the USPTO is required, by statute, to examine each case. I mean, besides the fact that 120 seems to confer a right of priority with the word "shall", 131 says that the director "shall" cause an examination to be made.

Posted by: anonexaminer | Oct 17, 2007 at 08:07 PM
Anyone with information/comments/case support, etc., which may be helpful to GlaxoSmithKline should direct their comments to GSK's lead counsel, John Desmarais at Kirkland & Ellis. Mr. Desmarais's e-mail is: jdesmarais@kirkland.com, as listed on Kirkland & Ellis's website.

I have e-mailed a few comments, case citations, etc., to Mr. Desmarais since Friday, and Mr. Desmarais seems pleased to receive any thoughtful suggestions that might be of assistance.

I find that Kirkland & Ellis is doing an excellent job on behalf of GSK and will ultimately CRUSH the PTO! The very fact that the DOJ, which represents the PTO, finds itself complaining about the burden of "electronic paper" sent its way by GSK speaks volumes of how GSK's case stacks up. Further, the PTO's decision to "pull" the 37 C.F.R. §1.75(b) "flags" seems to suggest that the PTO might now be on the defensive. It's arrogance is finally catching up with it!

Posted by: Edwin D. Schindler | Oct 17, 2007 at 09:33 PM
"If you file two cases with 20 claims each that are indentical, the USPTO is required, by statute, to examine each case. I mean, besides the fact that 120 seems to confer a right of priority with the word "shall", 131 says that the director "shall" cause an examination to be made."

Not under the new rules

Posted by: metoo | Oct 17, 2007 at 09:56 PM
Today I had about twenty 25+ cases put back on my docket. Where are the other 10 that were taken off? ...I don't know. When I looked on PALM, it said "25+ withdrawn" for the cases that were put back. If there is a preliminary injunction forcing the PTO to put the 25+ cases back on the docket, I am not aware of it. The 25+ continuations on my "special new" docket and 25+ elected restrictions on my "regular amended" docket were never touched, even though they would have been subject to the new rules. Our SPE has sent no e-mail to clarify the situation.

Posted by: Dave | Oct 17, 2007 at 10:18 PM
I see from the Docket Sheet in the GSK v. Dudas action that Judge James C. Cacheris, the judge for the Tafas v. Dudas action, has entered an Order consolidating the two cases, which is not surprising, and has now re-scheduled the hearing on GSK's motion for preliminary injunction to the morning of October 31, 2007. The loser on the preliminary injunction motion will have to make a dash to the CAFC that afternoon.

Posted by: Edwin D. Schindler | Oct 17, 2007 at 10:18 PM
"Ideally, I would rather see every district court assigned a "patent" judge or judges that are technically trained. I would prefer my claims interpreted by such judges."

I would prefer that, too.

Posted by: Malcolm Mooney | Oct 17, 2007 at 10:19 PM
CRUSH THE PTO

I like the sound of that. I used to like them, despite the heartaches of prosecution. However, things change. This is now my plea to the gods. But please, spare the examiners.

Posted by: Matt Foley | Oct 17, 2007 at 10:26 PM
An oldie but a goodie:

One dark evening Jon Dudas was on his hands and knees under a street light looking through the grass.

A pedestrian asked what he was looking for.

"The keys to my car." said Jon.

Having some time and feeling helpful, the pedestrian joined Mr. Dudas in his search.

After a while, with no success, the pedestrian asked: "Where were you when you lost your keys?"

"Over there by my car." the Mr. Dudas gestured.

The pedestrian was puzzled. "Why are you looking for them here?"

Jon Dudas explained: "The light's better!"

Posted by: A | Oct 17, 2007 at 10:57 PM
The K & E firm profile for Desmarais (GSK's attorney) includes "P.C." after his name - - what the hell is P.C.???

Posted by: anon | Oct 17, 2007 at 11:05 PM
just an ordinary inventor >> this might be of interest

by John Orange

JUDGE PAUL MICHEL'S TOP TEN DRAFTING TIPS

At the Newport Beach Seminar three eminent Judges from different US Courts gave their views on how Patent practitioners could improve their presentation of claims before their Court. Judge Paul Michel of the CAFC provided a list of ten points that he considered should be followed in preparing patent applications. These tips are produced below, as recorded on the fly and

therefore with no guarantee of accuracy:-

1 - Make sure there is support for the claims; track the language used in the claim back to the specific description to ensure the same terminology is used.

2 - Check whether the term used has an established meaning in the art and whether that meaning is appropriate in the particular circumstances in which it is to be used.

3 - Avoid amendment during prosecution!

4 - Prosecute the claims for literal, not equivalent, scope.

5 - Know the Federal Court case law on construction. Look at the decision as a whole, not just a stray phrase, and read all the cases.

6 - Where there is more than one possible meaning for a term, and in the absence of other factors, the customary meaning in the art is more relevant than the ordinary meaning.

7 - Dictionaries relevant to the art are a prime source for ascertaining the appropriate meaning of the term.

8 - When listing and discussing prior art references, check that the art uses a term in the same manner as in the specification and describe the art using terminology consistent with that used to describe the embodiments..

9 - Describe multiple embodiments wherever possible.

10 - Avoid creating a prosecution history except where you wish to establish a broader interpretation than might be the customary interpretation.

Posted by: ironicslip | Oct 17, 2007 at 11:27 PM
"re-scheduled the hearing on GSK's motion for preliminary injunction to the morning of October 31, 2007. The loser on the preliminary injunction motion will have to make a dash to the CAFC that afternoon."

Well even though the hearing is on Oct 31, a decision will not be rendered that day, will it?

Posted by: patent leather | Oct 17, 2007 at 11:38 PM
It will have to be a ruling from the bench on the 31st in order for the loser to file an emergency appeal at the CAFC the same day.

The 31st will indeed be "trick or treat" for all of us.

Both cases were also consolidated with Judge Cacheris.

Posted by: anon | Oct 18, 2007 at 12:08 AM
Does anyone know what Judge Cacheris' history is with regard to preliminary injunctions? And can the CAFC really hear an emergency appeal on the same day??? Although I am sure they are reviewing the case now.

Dudas should in the very least suspend enforcement of the rules until the CAFC has heard the "emergency appeal" (if needed).

Posted by: patent leather | Oct 18, 2007 at 12:38 AM
"Besides the PTO itself, is there anyone that has commented favorably on the new rules?"

Yes, the firms that represent Intel have commented favorably. What a surprise. This should be a tipoff to the USPTO that the rules severely hurt the small guys with less money. But I'm convinced they don't care.

Posted by: patent leather | Oct 18, 2007 at 01:16 AM
In other news

http://jgdmlgd.blogspot.com/2007/10/amazon-one-click-patent-rejected-by-us.html

The irony, of course, is that this patent smelled worse to the public than anything before or after.

And now it's official: it was a bunch of crap.

Posted by: Malcolm Mooney | Oct 18, 2007 at 01:29 AM
Anon,

The whole point of my post was that we should not have to wait until the CAFC to be reasonably sure of claim interpretation. The CAFC should only be able to overturn a lower court claim interpretation for clear error or whatever the standard is for matters of fact.

Joe

Posted by: Lionel Hutz | Oct 18, 2007 at 01:48 AM
Malcolm, while I'm as pleased as you are with the issuance of an OA in the re-exam that says the one-click patent is crap, it (unfortunately) ain't over till it's over. Please let us know when this thing is really dead for good.

Posted by: Prosecutor | Oct 18, 2007 at 04:38 AM
This is a Charlie Foxtrot. I want some heads and I want them now. I believe we should start with Dudas being removed from Office. Laides and gentlemen it is time for politics. They messed with the system and now it is time the system messes back. What is happening with that Peterlin case? Her head should roll too for backing this garbage. These GD rules are changing so fast I can't keep up with them. That is and of itself violates due process. Don't the people in the patent office know anything about the Constitution. WE HAVE A RIGHT TO A REPUBLICAN FORM OF GOVERNMENT. You cannot have a republican form of government without the citizens having an opportunity to know what is exepected of them. In short anyone who supports the implementation of these rules is simply a fascist.

Posted by: jarjarstinks | Oct 18, 2007 at 09:19 AM
Charlie, I am too old to serve, but I will pray for you: Our Lady of Divine Retribution, don't fail us now.

Posted by: anonymous | Oct 18, 2007 at 09:45 AM
Guess what, my cases are no longer flagged as being subject to the 1.75(b) showing. Ya know what. It is time to call the Department of Justice and start having every single employee investigated to see if there is a conspiracy within the agency to violate the laws and regulations of the United States. Are applicants actually being denied patent term by deliberates acts of the USPTO in delaying examination of the application. Perhaps we should talk about retroactively giving each patent the longer of 17 from issue or 20 from priority. He he he he.

Posted by: outheresomewhere | Oct 18, 2007 at 12:00 PM
Guess what, my cases are no longer flagged as being subject to the 1.75(b) showing. Ya know what. It is time to call the Department of Justice and start having every single employee investigated to see if there is a conspiracy within the agency to violate the laws and regulations of the United States. Are applicants actually being denied patent term by deliberates acts of the USPTO in delaying examination of the application. Perhaps we should talk about retroactively giving each patent the longer of 17 from issue or 20 from priority. He he he he.

Posted by: outheresomewhere | Oct 18, 2007 at 12:01 PM
Do you trust the DOJ? It appears the body-snatchers have completed their long term plans at DOJ. It is also apparent they have in all the agencies leading up to the publication of these rules.

Posted by: Mr T | Oct 18, 2007 at 12:16 PM
I never thought I'd be rooting more for someone other than the Sox in October, but I have to say, GO GSK!

Posted by: Opampman | Oct 18, 2007 at 12:44 PM
Someone posted a while back a question regarding what the real problem was - the PTO says the problem is the backlog - and asked how can we solve it. Here's an easy answer. Take all of the "lost examining" hours the PTO spent promulgating the rules, responding to comments, traveling on road shows, defending the rules, publishing OG notices and the like, and now defending

litigation, and spend those hours doing their job - Examining applications. The backlog would be gone!

Posted by: patentdood | Oct 18, 2007 at 01:31 PM
AMEN patentdood

Posted by: outheresomewhere | Oct 18, 2007 at 02:16 PM
My two cases also have lost their "Flagged" status and now show merely "Docketed". My voicemails to the Examiners assigned those cases went unanswered.

Posted by: CliveFenster | Oct 18, 2007 at 02:40 PM
Good idea dood, after they are CRUSHED, dust the managers off and send them back to the shoes for a 10 year sentence! It's not too fun in the shoes, ha ha.

Posted by: Mr T | Oct 18, 2007 at 02:56 PM
apparently there was a study done awhile back which determined that if the federal government had not been stealing fees paid to the PTO but instead had given these fees to the PTO and the PTO had spent the money to train and hire new examiners that there would be no backlog. Does anyone have any information on that study? Thanks

Posted by: Curious | Oct 18, 2007 at 03:29 PM
apparently there was a study done awhile back which determined that if the federal government had not been stealing fees paid to the PTO but instead had given these fees to the PTO and the PTO had spent the money to train and hire new examiners that there would be no backlog. Does anyone have any information on that study? Thanks

Posted by: Curious | Oct 18, 2007 at 03:29 PM
One very interesting aspect of the GSK case is the inevitable discovery into the inner workings of the PTO. Given the numerous claims made by GSK, that discovery could be (and should be) wide-ranging. I am certain that it will get very nasty and that some of the information which comes out will be quite embarrassing. Imagine if they track down an examiner that testifies about how he was told to stop examining applications with more than 5/25 claims long before the rules were even published. And the PTO's goofy rules in 37 CFR 104.21 et seq will not help them a bit. I also assume that the PTO is being diligent in maintaining and preserving ALL documents relevant to the new rules, including internal e-mails and the like.

Posted by: metoo | Oct 18, 2007 at 03:33 PM
Where are all the guys who planned to sue the PTO. GSK, Tafas and we need your help. PLEASE join the suit!

Susan Dudley is now looking at the IDS rules, and again David Boundy submitted a letter tearing into the PTO, which must be CRUSHED.

Posted by: Mr T | Oct 18, 2007 at 04:30 PM
Mr. T: "Susan Dudley is now looking at the IDS rules, and again David Boundy submitted a letter tearing into the PTO, which must be CRUSHED."

Will these rules be effective immediately or will there be a waiting period first? Does anyone know? Should we all start going through our files to make sure every reference is submitted now?

Posted by: patent leather | Oct 18, 2007 at 05:10 PM
What's all this about new rules? When did that happen?

Posted by: Malcolm Mooney | Oct 18, 2007 at 05:57 PM
You mean the new IDS rules, Malcolm? There the ones that are now being reviewed by OMB - the ones that no one outside the PTO and OMB have seen - the ones which are presumably similar to the proposed rules the PTO previously published, but I'm sure slightly less draconian than those originally proposed so that the PTO can say with a straight face "see, we listened to all of the comments submitted to us and changed the rules in light of them" - the IDS rules that will be one more nail for the coffin in which our patent system is being systematically and methodically destroyed

Posted by: metoo | Oct 18, 2007 at 06:05 PM
MM: Look over at patent prospector for details.

PL,I think I remember Feb. or March as the projected date.

Posted by: Mr T | Oct 18, 2007 at 06:07 PM
Generally, if you file more than 20 references, expect to prepare an ESD-like document!

I made a flow chart of the proposed rules, and they are bad! and I mean bad bad.

Posted by: Mr T | Oct 18, 2007 at 06:09 PM
IDS rules that require a particular format for presenting known prior art which may be relevant, are, generally speaking, unenforceable: If an applicant/attorney cites to the PTO references that may be material, whether or not the PTO actually considers such references, would not appear to impact on the inventor's or his attorney's duty to disclose under 37 C.F.R. §1.56.

Essentially, if references are cited to the PTO anywhere in the Specification or prosecution history - assuming that such material references are not deliberately "buried," but presented in a manner in which the Examiner should take notice of them - an Examiner is then "on notice" of the potentially material reference(s). If the Examiner chooses to deliberately ignore a reference clearly cited in a prosecution history, because it might not meet the stringent requirements of the PTO, then the solution may simply be to clearly make the reference known to the Examiner and "call it a day." There can be no "equitable conduct," it would seem, if an attorney makes a bona fide effort to draw the Examiner's attention to a particular reference which the Examiner then chooses to ignore, because the manner of "disclosure" is not perfectly compliant with the PTO's ridiculous requirements. At some point, the Patent Bar will simply "cite and forget," thereby avoiding a later finding of inequitable conduct, but refusing to "jump through hoops" by Rules that require applicants and their attorneys to do the work that the PTO was created, and is paid, to do.

An applicant and his attorney have an obligation to cite material references to the PTO, inasmuch as the PTO cannot be expected to uncover any, and all, material references and, if an applicant or his attorney knows of a reference that is material, it is only "fair" and equitable that it be made known to the PTO. Once this obligation is fulfilled, it must not be forgotten that the attorney represents the patent applicant, and not the "public-at-large," which is, legally speaking, the PTO's "client." As attorneys, we should disclose material prior art to the PTO, but we should not be required to "reject" our own clients' claims.

The PTO may choose to implement particularly stringent rules for the disclosure of prior art, however, it there is a lack of compliance, and the PTO refuses to properly consider prior art "thrown in its face," then it is deliberately refusing to perform the statutory function that it was created to carry out.

Posted by: Edwin D. Schindler | Oct 18, 2007 at 10:57 PM
Correction of typo in CAPS: "There can be no "INequitable conduct," it would seem, if an attorney makes a bona fide effort to draw the Examiner's attention to a particular reference which the Examiner then chooses to ignore, because the manner of "disclosure" is not perfectly compliant with the PTO's ridiculous requirements."

Posted by: Edwin D. Schindler | Oct 18, 2007 at 11:01 PM
Thanks Mr. Shindler. Do you really think this practice would fly? Otherwise, I agree with everything else you said!

Posted by: anonymous | Oct 18, 2007 at 11:11 PM
um, no, it won't fly if the NEW IDS rules are promulgated.

Posted by: metoo | Oct 19, 2007 at 12:02 AM
I just checked the docket. The case was reassigned to a judge named James Cacheris. He overruled the former judge's order to have the hearing on 10-26 and allowed the PTO until 10-31-07 to respond to the PI hearing. He has also consolidated this case with the Doctor's case and set the hearing date for both on the same day.

Posted by: patent fool | Oct 19, 2007 at 12:47 AM
Wikipedia article on James C. Cacheris.

http://en.wikipedia.org/wiki/James_C._Cacheris

Posted by: Mark Nowotarski | Oct 19, 2007 at 07:51 AM
Not good - why give the PTO more time when they should have seen this coming and Tafas was filed long ago?

"CNN Dobbs: 'I spend more time worrying about whether or not the United States can survive the remaining 15 months of his ebbing presidency'... "

Can the Patent Office survive?

Posted by: me | Oct 19, 2007 at 09:04 AM
FYI a memo was just issued by the PTO management saying that we are to continue examining cases that exceed 5/25 until Nov. 1. All cases have been put back on examiner's dockets, according to the memo.

-An examiner.

Posted by: Hecky's: It's the Sauce | Oct 19, 2007 at 11:35 AM
""CNN Dobbs: 'I spend more time worrying about whether or not the United States can survive the remaining 15 months of his ebbing presidency'... "

LOL. Loud Obbs isn't in love anymore.

Posted by: Malcolm Mooney | Oct 19, 2007 at 12:26 PM
Thanks for the link to Judge Cacheris bio. Penn and GW law, must be a smart guy. Smart enough to realize the rules are illegal, I hope.

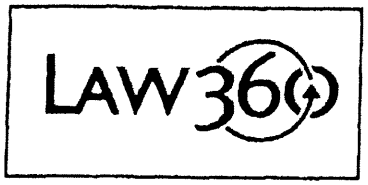
Has anyone filed a motion for the court to hear an amicus brief?

Posted by: patent leather | Oct 20, 2007 at 12:46 AM
"Has anyone filed a motion for the court to hear an amicus brief?"

Do trial courts take amici? I've never heard of this, but I've lived a sheltered life.

Posted by: Federal Courts | Oct 21, 2007 at 01:00 AM

EXHIBIT E



THE NEWSWIRE FOR BUSINESS LAWYERS

Cisco, Linksys Sued Over VoIP Patent

DOCUMENTS

Complaint [PDF]

RELATED

Sections

- Intellectual Property
- Technology

Organizations

- Albritton Law Firm
- Cisco Systems
- Ward and Smith

Articles

- Qwest, Primus Sued For Infringement
- Earthlink Settles VoIP Suit With Web Telephony
- Cisco Sues Apple Over iPhone Trademark
- Apple Reaches iPhone Settlement With Cisco
- Patent Holding Firm To Drop VoIP Suit Against Cisco
- Patent-Holding Co. Refiles Cisco Infringement Suit
- Cisco Prohibits Anonymous Blogging After 'Troll' Spat

By **Amanda Ernst**

Law360, New York (October 16, 2007) -- Patent holding company ESN LLC has filed a patent infringement suit against Cisco Systems Inc. and its subsidiary Linksys, claiming infringement of a recently issued patent for voice over Internet protocol technology.

According to a complaint filed Monday in the U.S. District Court for the Eastern District of Texas, the U.S. Patent and Trademark Office issued U.S. Patent Number 7,283,519 to ESN on Oct. 16. The company claims that Cisco and Linksys are selling products that infringe on the '519 patent, including numerous router models and IP telephone systems.

The '519 patent, entitled "Distributed Edge Switching System for Voice-Over-Packet Multiservice Network," describes switching systems that can be used to send voice and other data over a broadband network.

Connecticut-based ESN claims that Cisco and Linksys sell voice and unified communications systems that infringe the '519 patent. The infringing products include various Cisco integrated services routers, the Cisco Unified Communications 500 Series, Linksys' SPA-9000 IP Telephony System and Linksys' SVR-3000 router, the complaint said.

The patent's inventor, Gregory D. Girard, filed an application for the '519 patent in April 2001. The PTO published the application in November 2002 as U.S. Patent Application Publication No. US 2002/0176404, the complaint said. Girard is co-founder of ESN.

ESN notified Cisco and Linksys of the published '404 patent application in August 2006. ESN also sent the defendants "specific notice in writing of certain infringing activities" in June 2007, according to the

complaint.

But regardless of the notices, Cisco and Linksys continued to infringe on the '519 patent, ESN alleged. The rival companies' infringement is therefore willful, ESN said.

Additionally, ESN has asserted that Cisco and Linksys violated the company's provisional rights.

"Cisco and Cisco-Linksys have violated ESN's 'provisional rights' under 35 U.S.C. § 154(d) by making, using, offering for sale, selling and/or importing the invention as claimed in one or more claims of the published '404 application, thereby entitling ESN to a reasonable royalty for such violation from at least Aug. 11, 2006 until the date of the '519 Patent's issuance on Oct. 16, 2007," ESN said in the complaint.

ESN is seeking a permanent injunction against Cisco and Linksys, as well as damages, including disbursements, court costs and attorneys' fees.

Representatives for Cisco did not return requests for comment Monday.

A search of federal dockets revealed that this is the first patent infringement suit filed by ESN.

The patent in this case is U.S. Patent Number. 7,283,519.

ESN is represented in this matter by attorneys from Albritton Law Firm and Ward & Smith Law Firm.

Counsel for Cisco and Linksys could not immediately be identified.

The case is ESN LLC v. Cisco Systems Inc. et al., case number 5:07-cv-00156 in the U.S. District Court for the Eastern District of Texas.

TODAY'S LAW NEWS

Alternatives Abound For Law-Leery Attorneys

Attorneys who are eying a career change — whether they've been laid off or simply don't want to practice law anymore — have a much broader range of options available today than they have had in the past, experts say.

Dried-Up DIP Financing To Intensify Ch. 11 Sell-Offs

Debtor-in-possession financing – the lifeblood of bankrupt companies – has become the latest casualty of the economic crisis, exacerbating the trend in Chapter 11 to abandon restructuring plans for a quick fire sale.

Billable-Hour System Under Scrutiny From Clients

With attorneys charging upward of $1,000 an hour for legal work despite the economic downturn, many clients are pushing to do away with the billable-hour system altogether.

SECTIONS

Bankruptcy

- Lehman's $3.4B Property Fund To Seek New Sponsor
- WR Grace Disclosure Statement Draws Objections
- Motor Coach Scores Approval For $311M DIP Loan

Competition

- Dutch Regulator Fines Sara Lee Unit €269,000
- Plaintiffs Lack Standing In Flonase Suit: GSK
- Feds Want Device Maker's Subpoena Suit Tossed

Employment

- 3rd Circ. Blocks Bid For Rehearing In Vioxx Suit
- Whirlpool To Settle FLSA Action For $9M
- Northwest Pilots Get Class Cert. In ERISA Suit

Energy

- DOI Seeks To Change Dumping Rule For Coal Mines
- Govt. Help Needed For CO2 Storage, Report Says
- Billable-Hour System Under Scrutiny From Clients

Environmental

- Cook Inlet Beluga Whale Named Endangered Species
- Vesuvius USA To Spend $240K In EPA Settlement
- DOI Seeks To Change Dumping Rule For Coal Mines

Financial Services

- Lehman's $3.4B Property Fund To Seek New Sponsor
- AIG Halts Lobbying Against Mortgage Reforms
- Citigroup Wins $364M Verdict Against Parmalat

Health

- Tyco Loses JMOL Bid In Needle Shield Patent Suit
- Plaintiffs Lack Standing In Flonase Suit: GSK
- 3rd Circ. Blocks Bid For Rehearing In Vioxx Suit

Intellectual Property

- Tesseron Asks Court To Drop IP Suit Against Konica
- Tyco Loses JMOL Bid In Needle Shield Patent Suit
- Polaris Patent Case Needs New Damages Trial: Court

Product Liability

- Hong Kong Seeks To Beef Up Food Regulator
- WR Grace Disclosure Statement Draws Objections
- Insurers Beat Indemnification Claims In High Court

Securities

- 3rd Circ. Blocks Bid For Rehearing In Vioxx Suit
- Citigroup Wins $364M Verdict Against Parmalat
- WilmerHale Snags Former SEC Branch Chief In Calif.

Technology

- Fed. Circ. Reverses Verisign Credit Card Patent Claims
- Billable-Hour System Under Scrutiny From Clients
- Global Satellite Radio Co. Falls Into Ch. 11