

BRANCH CALLING AND CALLER ID BASED CALL ROUTING  
TELEPHONE FEATURES

CROSS REFERENCE TO RELATED APPLICATIONS

5 [0001] This application is a continuation of U.S.  
application Ser. No. 11/948,965, filed Nov. 30, 2007,  
entitled "Branch Calling and Caller ID Based Call Routing  
Telephone Features," which is a divisional of U.S.  
application Ser. No. 10/426,279, filed Apr. 30, 2003,  
10 entitled "Branch Calling and Caller ID Based Call Routing  
Telephone Features," now U.S. Patent No. 7,324,635, which is  
a continuation-in-part of U.S. application Ser. No.  
09/565,565, filed May 4, 2000, entitled "Telephone Call  
Control System for the Public Switched Telephone Network,"  
15 now U.S. Pat. No. 6,574,328, The subject matter in the  
above-identified co-pending and commonly owned applications  
is incorporated herein by reference.

FIELD OF THE INVENTION

20 [0002] This invention relates to telephone services and,  
in particular, to a system for allowing a subscriber to  
select features of the subscriber's telephone service and  
to various novel features that can be selected.

BACKGROUND

25 [0003] People have used various means for limiting  
interruptions due to the telephone. In the past, people  
used switchboards and secretaries to screen incoming, or  
inbound, calls. Voice mail systems took over some of this  
30 role both in the home and in the central office. Today,  
there are web-based companies managing 3rd-party call  
control, via the toll-switch network, which allow users to  
enter call control information through a web portal. There  
are also edge devices in each of the public telephone

company's central offices which provide local control, but offer an extremely limited number of features and do not provide true 3rd-party call control.

5 [0004] The web-based toll systems provide good user interaction but they are not economical and cannot take advantage of local number portability because they do not provide local control and connectivity.

10 [0005] The Public Switched Telephone Network (PSTN) consists of a plurality of edge switches connected to telephones on one side and to a network of tandem switches on the other. The tandem switch network allows connectivity between all of the edge switches, and a signaling system is used by the PSTN to allow calling and to transmit both calling and called party identity.

15 [0006] Until now, optional features were provided by the local service telephone company (telco) through the edge switch at the central office (CO). It was not possible to provide optional features through any other means. Control of these features was done through the first party (calling party) or the second party (called party), or worse yet, manually by calling the business office.

20 [0007] In the past, numerous devices have been built that allow the connection of two lines together at an edge switch. These devices can be used to add features to a telephone network by receiving a call on one line and then dialing out on another line. The problem with these devices is that, because they are connected through an edge switch, transmission losses and impairments occur, degrading the overall connection. In addition, signaling limitations prevent full control, by the subscriber or the system, over  
30 the call.

[0008] A preferred embodiment of the inventive system described herein connects at the tandem, thereby eliminating these problems.

[0009] In the edge devices residing in the PSTN central offices, the 1st party (the calling party) has numerous features available (dialing options). The 2nd party (called party) also has options available such as call forwarding, but these features typically require access from the first or second party's device and are extremely awkward to program. The user interaction is not only awkward, it is limited and requires interaction with the telephone company to provision them. In other words, past systems for provisioning, meaning addition, modification, or control of telephone features, required a subscriber to make the feature selection through the telephone business office. Central office workers would then implement the provisioning under request of the business office.

[0010] Call Forwarding is one popular provision. There is signification transmission degradation for Call Forwarding to take place. The calling party pays for a call to the edge device, and the edge subscriber, the called party, pays for the call to the forwarding number. For enhanced inbound call control to occur, a direct 3rd-party call control means is needed.

[0011] A variety of services have arisen to address the problems mentioned above. Many of these systems allow the called party to make changes to his/her call forwarding attributes which do not allow direct 3rd-party call control. These services provide good user interaction, some via the internet, but they rely upon the toll network through the use of "800" numbers.

[0012] This requires the subscriber to pay by the minute and does not allow the subscriber to take advantage of number portability in order to obtain 3rd-party call control. There are other toll network mechanisms for remote  
5 call forwarding. For example, MCI offers a service where the customer can remotely change the forwarding target number for "800" numbers. Contacting the ultimate end-user before terminating the first incoming call is similar to the manner in which "800" credit calls and collect calls  
10 are processed, but these are not done at the local subscriber level.

[0013] In addition to these toll services, there are edge devices that perform some of the same services. Edge devices such as phones and PBXs that include voice mail,  
15 inter-active voice response, call forwarding, speed calling, etc., have been used to provide additional call control. These devices allow the phone user direct control over incoming and outgoing calls. The disadvantage of edge devices is that they add cost, degrade voice and  
20 transmission quality, can be difficult to program, are not easily programmed remotely, can require the user to pay for two lines, provide lower quality of service, and cannot provide the same level of functionality as a system that controls the PSTN directly. There are Voice Over Internet  
25 Protocol (VoiP) products emerging that provide better user interfaces and control but they do not take advantage and voice quality of the PSTN.

SUMMARY OF THE INVENTION

30 [0014] A system for allowing a subscriber to remotely control features is described herein along with various telephone features that may be programmed into the system. A

subscriber may be any customer using the telephone service, in contrast to employees of the PSTN who may use special communication networks within the PSTN. Two such features are caller ID (CID) based call routing and branch calling.

5 The system allows the subscriber to set up a feature where the CID signal is detected within the PSTN and automatically associated with stored information relating to the caller.

The stored information may have been previously entered into a memory within the PSTN by the subscriber via the world  
10 wide web. The CID signal may be also used to route the call to one of more forwarding numbers or to take any other action, such as blocking the call. This feature also allows the subscriber to use the CID signal to display certain information even though the caller may have her CID blocked.

15 **[0015]** Another feature described herein is referred to as branch calling, which allows a call to be forwarded to multiple telephones simultaneously, where the first telephone answered terminates the calling of the other telephones (or any other end units).

20 **[0016]** The preferred system described herein adds direct control of third party call control features, but does not suffer from any of the disadvantages listed above, and allows the subscriber to manage his/her telephone system in a dynamic and exceptionally useful manner that is not  
25 currently available through the existing PSTN. The system allows enhanced direct third-party call control features, such as selective call routing and remote dialing, to be added to the PSTN (Public Switched Telephone Network) using local call control and providing dynamic provisioning of the  
30 system by the subscriber. Direct 3rd-party control means that the ability to provision the 3rd-party features is directly available to a subscriber, eliminating the need to go through the telephone company (telco) business office.

**[0017]** In one embodiment, the system includes a processor  
35 (referred to herein as a tandem access controller) connected

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