ICW server bridges the call to the VoIP connection. The subscriber's computer must be equipped with appropriate software, a microphone and speakers to enable the VoIP option, as is well understood. This option permits the subscriber to talk with the caller without disconnecting from the Internet.

If the subscriber profile specifies that calls are to be answered on the subscriber's primary phone line, the process continues at step **340**. In that case, the subscriber's Internet connection is dropped in order to permit the call to be answered. At step **340**, the ICW system drops the Internet connection and the subscriber's local loop is returned to an on-hook condition. At step **342**, the ICW server redirects the call through the PSTN back to the subscriber's local loop, which permits the subscriber to answer the incoming call.

At step **312**, if the subscriber selected "play announcement", the process continues to step **344** where the user's pre-specified preference is determined. If the subscriber selected "I'll Call You" from the call treatment options presented in the pop-up window, the process proceeds at step **346**, where an announcement such as "E.msg" shown in Table 1 is played to the caller. If the subscriber selected "Call Me Back" from the call treatment options, the process proceeds to step **348**, where an announcement such as "D.msg" shown in Table 1 is played to the caller. If the subscriber selected "Terminate Call" from the call treatment options, the process proceeds to step **350**, where an announcement such as "F.msg" shown in Table 1 is played to the caller.

If the ICW subscriber **100** receives a call notification during a telephone session answered at the ICW client computer **110** via VoIP, another notification window is displayed on the display screen **112**, and the call is logged. The subscriber can then screen the second call by selecting a call treatment option for the second call. If a selected call treatment option cannot be applied because of resource or network unavailability, the second call is sent to messaging.

The subscriber **100** is automatically de-registered from an ICW service session when the Internet connection is dropped.

A Call Forward Unconditional (CFU) feature forces all calls to a Directory Number (DN) to be redirected to another PSTN termination. CFU has precedence over CFBL and may be used by an ICW subscriber **100** to redirect all incoming calls to the ICW service node **150**. If the subscriber enables CFU, after specifying in his profile that calls are to be answered on his primary phone line, then at step **342**, the ICW server would attempt to redirect the call through the PSTN back to the user's phone line, at which point, the CFU feature would transfer the call back to the ICW service node **150**. A loop detection process detects this condition and ends the call with a busy call treatment. VoIP bridging of the call is the only option if CFU is applied to the line.

Although the invention has been described with exclusive reference to POTS subscriber loops, it should be understood that the invention is equally adapted for use with other telephone services that support only one concurrent transmission mode. The invention is therefore adapted to be used for narrowband wireless services, and the like.

Furthermore, although the invention has been described for sake of simplicity with reference to call termination and redirection being handled directly by ICW servers **154**, it should also be understood that call termination and redirection services may be provided by an intermediate switching network in a manner known in the art.

The embodiments of the invention described above are intended to be exemplary only. The scope of the invention is therefore intended to be limited solely by the scope of the appended claims.

The invention claimed is:

1. A method of processing a telephone call from a calling station to a called station that is busy as a result of having established a data connection to a data network via an access server, the method comprising steps of:

receiving the call at a telephone network switch;

responsive to the called station being busy, forwarding the call to a call-waiting application server; and

responsive to receiving the call at the call-waiting application server, sending a data message to computer equipment at the called station used to establish the data connection, to notify a subscriber at the called station of an incoming call and providing a selection of call treatment options to the subscriber, comprising steps of:

a) storing at a registration server a complete copy of a subscriber profile for each subscriber to the system, the profile defining subscriber pre-selected preferences for incoming call processing options and call treatments;

b) registering the subscriber at the registration server when the subscriber establishes the data connection to the data network via the access server;

c) accepting at one of a plurality of application servers, the telephone call placed to the subscriber by a caller from the calling station, when the subscriber's telephone line is busy, the application server establishes a data connection to the registration server to retrieve a copy of the subscriber profile when the telephone call is accepted, and inspects the subscriber profile to determine how the incoming call should be processed based upon the pre-selected subscriber preferences.

2. A method as claimed in claim **1** further comprising a step of checking the subscriber profile to determine whether the subscriber should be notified of the waiting call from the caller.

3. A method as claimed in claim **2** further comprising a step of notifying the subscriber of the waiting call and prompting the subscriber for a selecting a pre-determined call treatment option for the waiting call based upon the pre-selected subscriber preferences in the subscriber profile.

4. A method as claimed in claim **2** further comprising a step of examining the subscriber profile to determine whether the caller should be requested to leave a voice message for the subscriber.

5. A method as claimed in claim **4** further comprising a step of recording a voice message left by the caller, or forwarding the caller to an external voice mail system.

6. A method as claimed in claim **5**, further comprising a step of, on instructions received from the subscriber, completing the call to the subscriber via a predetermined path.

7. A method as claimed in claim **6**, further comprising a step of rerouting the call to an alternate called station associated with the predetermined path.

8. A method as claimed in claim **6**, further comprising a step of dropping the data connection to the data network and rerouting the call to the called station.

9. A method as claimed in claim **6**, further comprising a step of bridging the call from the call-waiting application server through the data network to the computer equipment at the called station as a Voice-over-data network call.