4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

White Paper
"Integration of TTY Calls into a Call Center Using the Placeholder Call Technique"
Updated: February 2007

Overview of Call Centers

All organizations have a phone system, but a "call center" has special requirements and a specialized phone system. A call center will have a group of call "agents" accepting customer service, technical support, or other types of calls from customers or clients. Traditional call centers are often designed to accept only voice calls over the PSTN, that is, telephone calls from hearing and speaking persons traveling over the Public Switched Telephone Network.

A call center will normally have an "ACD", or "Automated Call Distribution" system, as part of its phone system. The ACD will accept incoming telephone calls, and will often put the caller on hold in a call "queue". The ACD will look at the available call agents, and the ACD will then direct incoming calls to particular call agents as they become available. Call agents will log into the ACD, and must log out if they are leaving their assigned station. The ACD will send only one call at a time to a given call agent, and the ACD will maintain CDR (call data records) of call activities. CDR reports can be created which show call volumes, agent activities on calls, and so on. Many ACDs support advanced features such as skills-based routing of call to agents based on the needs of a particular caller.

Call Centers and Text Calls from TTYs

Call centers often do not do well in accepting non-voice calls such as TTY calls from deaf persons, or other types of non-voice communications such as web calls, email inquiries, and so on.

NXi's NTS product offers a novel approach to adding new call types to a traditional call center. This patent pending technique is called the "Placeholder Call" approach. The Placeholder Call approach offers the advantage that no direct integration with the call center ACD is required, yet TTY calls from the deaf, and other types of non-voice calls, are queued, routed, and tracked by the existing ACD of a traditional call center.

The sequence of events, or call flow, in the Placeholder Call approach is shown in the "Example Call Sequence" section below. In this particular example, the caller is assumed to be a deaf person using a TTY.

4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

Installation and Configuration Issues

NXi's NTS product is a "client/server" product. Below are some notes on the hardware and software configuration needed for an NTS Placeholder Call system.

– The NTS "server" software is typically installed on a single PC. There may be more than one NTS server for redundancy.
-- The NTS server links to the phone system of the call center via analog or digital phone lines from the switch to the NTS telephony card. A range of telephony cards are supported in NTS-6. NTS 6.3 or later will support the "SIP" protocol as the connection method between NTS and the phone system. If a telephony trunk connection is used, then a digital T1 trunk works best since it can carry the DNIS (number dialed) and ANI (number of the calling party) for the calls.
-- There is no software or other integration needed between NTS and the call center ACD; however, NTS supports certain integration techniques with particular ACD products as discussed below.
– The NTS "client" software is installed on the PC of each agent taking calls from the NTS system. The NTS client logs into the NTS server at the agent station, and this is in addition to the normal agent log in to the ACD itself.

Example Call Sequence for TTY Call to a Call Center

Suppose a TTY user calls the call center. The basic call sequence is explained below.

Step 1: The TTY call arrives at the call center phone system.
Step 2: The call center phone system directs the TTY call to the NTS server.
-- The connection between NTS and the phone system is either a T1 trunk or SIP/VoIP calls may also be used. If analog lines are used as the connection method, then there are certain restrictions in features. Contact NXi for details in this area.
-- Note: There are several means by which a TTY call can be initially directed to the NTS server: (a) the TTY caller dials a special TTY phone number, and the phone system does DID/DNIS routing based on the number dialed, (b) the call center IVR system detects the call is a text call, or (c) perhaps the call was initially answered by voice by an agent and was then transferred to the NTS server.

Step 3: The TTY text call will next be answered by a "call flow script" running on the NTS server.
-- Note 1: The NTS script can offer text menus and choices to the text caller. The TTY caller will respond to all choices or menus via the TTY keyboard and is not expected to generate DTMF (Touch Tone) responses.

4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

-- Note 2: if NTS has a database link to a backend database, then NTS can offer automated retrieval of information for the text caller. In this case, the text caller may not need to talk directly to a human operator. NTS-6 supports a gateway which can send a custom SQL query to almost any database via ODBC and other techniques.

Step 4: The NTS server creates the outbound Placeholder Call

-- In the current example, suppose the script is designed to send the caller to a call center agent automatically, or by the caller's choice. The NTS server will then send "Please hold" in text to the TTY caller, and the NTS server will place a call to the call center on a second telephony port. This call is called the NTS "Placeholder Call". The Placeholder Call is a true voice call into the call center.

– Note: As discussed further below, if an T1 ISDN PRI line, or a SIP/VoIP connection is used to the NTS server, then NTS can place the text caller's phone number as the ANI (caller ID) of the call to the call center. So, the call center will not see the phone number of the NTS server itself on the Placeholder Call, but rather the TTY caller's phone number on call center's "caller-ID" equipment.

Step 5: The NTS Placeholder Call will arrive at the call center phone system.

– The call center ACD can treat the NTS Placeholder Call as a normal voice call. So, this call may be queued with audio "Please wait" recordings. This is fine, because the text caller is getting separate text "Please hold" messages from the NTS server.

Step 6: The call center ACD will direct the voice Placeholder Call to an available call agent.

– As discussed above, NTS can place the original text caller's phone number as the ANI (caller ID) of the call. If the call center supports "ANI driven screen pops" of the caller's information, then this will still work with Placeholder Calls generated by TTY callers.

Step 7: (Optional step) After the call agent answers the voice Placeholder Call, the agent will enter his or her phone extension or "NTS user code" on their phone.

-- The optional Step 7 is necessary only if there is no integration between NTS and the call center ACD. When this integration is present, then the text chat session will simply appear on the agent's computer when he or she answers the voice Placeholder Call. See the section below "Integrating NTS into certain call center ACDs" for a list of supported call center ACDs.

-- In the "plain vanilla" or non-integrated approach, the voice recording placed on the Placeholder Call will say "You have a text call... please enter your user code" or similar. In this case, the agent must dial their user code on their phone keypad. The NTS server receives these DTMF digits and does a database query

4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

to find out which agent account has this user code. Once this is known, then the NTS servers sends the text chat session belonging to this call to the computer at this particular agent's station.

-- Some call centers using NTS Placeholder Calls will create a single auto-dial button on the phone console that the agent can press. In this case the voice recording can say "You have a text call, please press your TTY auto-dial button".

Step 8: The NTS server will now connect the text call to the computer at the correct agent station.

– The agent can now enter into a text chat session with the text caller using their PC.
– During this text conversation, the agent should not hang up the voice Placeholder Call. So, the call center's ACD knows this agent is on a call, and will not send this agent a second call while he or she is busy on the text call. The agent's time on text calls will be tracked and included in the standard call center's CDR reports.
– The NTS server maintains three call legs: the voice Placeholder Call, the TTY call from the outside party, and the text call to the agent's computer. If any of these three calls are hung up, then all three calls are terminated and the call ends.

Integrating NTS with Call Center ACDs

In some cases, NTS can eliminate Step 7 above. In other words, when a call agent answers the Placeholder Call in Step 6, the text chat call can be automatically sent to the computer at this agent station. There is no need for the agent to manually enter their user code for this to occur. Contact NXi for a current list of call center ACD products where this automation is available.

Accessing Remote Data Sources for Text Callers

Many IVR (Interactive Voice Response) systems provide on-line information to hearing telephone callers. For example, a bank may provide customer account balances for callers, a golf course might provide automated tee time reservation, and so on. Such automated services are often not provided for TTY text callers. NTS can provide for text callers the same information provided to hearing callers.

An NTS script can create a data request to a remote data source. This data source can be the same data source providing information for hearing telephone callers.

The "SQL Remote Procedure Call" block in an NTS script can send an arbitrary SQL query to almost any database supporting ODBC or other techniques. At run-time, this query goes out the "NTS SQL Query" gateway. The SQL query string itself is created by the NTS script writer,

4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

and must be designed to work with the particular external database being used. The return values must be "singletons" and not complex data structures. These return values become NTS script variables and can be sent to the text caller.

Placeholder Calls and Multiple Call Centers

A single NTS server, using Placeholder Calls, can direct TTY or other non-voice calls to more than one call center.

As an example, one organization using NTS had the following requirements. All TTY users in the U.S.A. would dial a single 800 number, but this organization wanted to send each call to a call center in that caller's region. In this particular implementation, NTS made its outgoing Placeholder Call to a single phone number, and NTS as usual placed the actual TTY's ANI on this call. A phone switch then directed each call to the correct regional call center for that caller, based on this ANI.

In a similar way, NTS could itself dial different numbers for the outgoing Placeholder Calls based the ANI of the caller, or on information or choices provided by the caller. So, this single NTS server could feed TTY calls to multiple call centers.

It is noted that, even in the "multiple call center" approach, each call agent receiving NTS Placeholder Calls will need to run the NTS client program logged into the NTS server. Please note that NTS supports a very secure and firewall-friendly approach to logins. See the white paper "NTS Security Issues" for details.

General Notes:

– DTMF information provided by voice callers.
  In some call centers, a voice recording will ask the caller to enter their account number or other numeric information using keys on their touch tone phone. NTS can support this type of call center. The answering script in the NTS server can ask the text caller for the same information. A TTY caller can then enter their account number or other numbers using their normal TTY keyboard. The NTS script can then play these numbers on the Placeholder Call to the call center at the beginning of the call using standard "touch tone" DTMF sounds.

4505 S. Wasatch Blvd, Suite 120 • Salt Lake City, UT 84124
801.274.6001 • 801.274.6002 fax • 801.274.6004 tty
www.nextalk.com • info@nextalk.com

Final Note:

Using the NTS Placeholder Call approach, any call center can handle non-traditional call types such as TTY calls from the deaf, web calls, email “calls”, VoIP calls over the internet, text calls from wireless hand-helds, and so on. Further, the ACD of a standard call center can track and route these non-traditional calls, and all call activity will be recorded in the standard call reports generated by the ACD. Contact NXi for a “live” demonstration of NTS and Placeholder Call technology.