# Tenor VoIP MultiPath Switch Application Note:

# IVR/RADIUS Services for calling card, pre-paid, and other payment systems

## Customer requirement

A service provider/carrier rolling out voice-over-IP wants to use either an existing or a new, best-in-class RADIUS-compliant system to implement payment schemes such as calling cards or pre-paid that require interactive voice response (IVR).

## Solution

Quintum Technologies' Tenor MultiPath Switch provides effective support for RADIUS-compliant third-party IVR applications. The Tenor can relay messages from the IVR system to the caller and the caller's keypad responses to the IVR system (for account number, PIN codes, etc.). This allows all transactions to be properly authenticated, authorized and credited/debited to caller accounts. Voice prompts can also be cached locally on the Tenor Switch for improved application performance.

## How it works

Quintum has embedded both IVR and RADIUS-compliant interfaces into Tenor Switches.

**RADIUS:** The RADIUS (Remote Authentication Dial-In User Service) protocol is an industry standard that is widely used by billing and other management applications to control network access. This process is often referred to as authentication, authorization and accounting (AAA). RADIUS provides standardized message formats for transmitting and receiving keypad input, account data, authorization codes and other information between access gateways (such as the Tenor switch) and billing servers. The Tenor's RADIUS interface thus enables the Tenor to interoperate with standards-compliant billing server applications software from a wide range of vendors.

**IVR:** The Tenor's IVR interface enables it to relay and/or play voice messages to customers, prompting them to input numeric information using their phone's keypad. This information can include the caller's account number, PIN, and the number the caller wishes to reach. The numbers that the caller enters can therefore be transmitted by the Tenor in RADIUS format over the IP network to the RADIUS/billing server. The server can then use that input to identify the customer, verify their identity using the PIN code, check the account status, and send back messages in RADIUS format telling the Tenor switch whether or not to proceed with the call.

The actual voice messages used in the prompting process are typically stored on the network in an IVR/TFTP server in the form of audio files that have been recorded in any language or style required. The audio files are transmitted via VoIP to the Tenor, which then plays them over the PSTN connection to the caller. These voice files can then be stored in cache memory on the Tenor for direct access and replay. Voice messages only have to be refreshed if the Tenor is powered off or reset, or if the service provider wishes to change the messages.

**Benefits**
The Tenor's RADIUS and IVR capabilities allow service providers to either:

1) **protect their existing investments in RADIUS-compliant back office billing systems, or**
2) **implement new, best-in-class call control systems**

By providing this support for third-party back office systems, Quintum enables service providers to enjoy all the rich functionality of the Tenor switch – automatic failover, easy configuration, efficient packet multiplexing – without having to compromise the flexibility of their billing systems, as often is the case with VoIP switches that come with their own built-in RADIUS server and/or IVR functions.
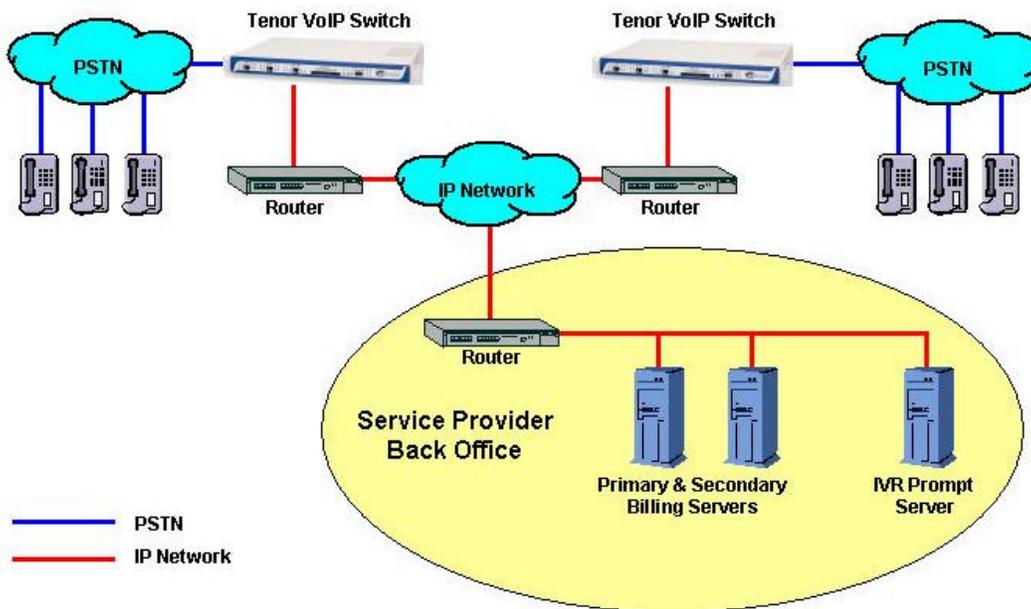
Service Provider IVR and Billing Implementation

*With its IVR and RADIUS interfaces, Quintum's Tenor VoIP MultiPath Switch integrates easily into service providers' authentication, authorization and accounting (AAA) systems.*