

Tornado System

KEY FEATURES

- Intelligence-at-the-Edge Architecture
- High Fault-Tolerance
- Support for IP Centrex and PBX Functionality
- DID Number Distribution and Provisioning
- Decentralized RTP/Voice Control
- SIP Protocol Support with NAT Traversal
- Automated Subscriber Management and Billing
- Decentralized Voicemail
- Unified Messaging and Call Forwarding
- Auto Peer Discovery

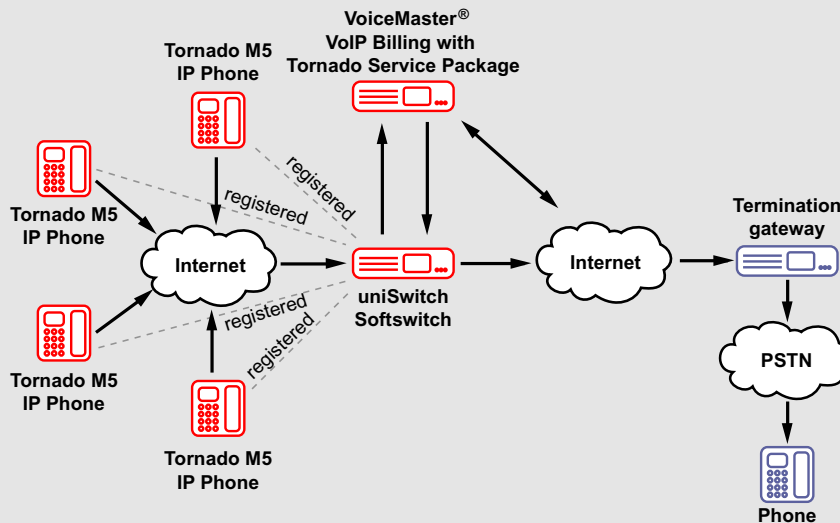
System Overview

Tornado is an extremely scalable and cost effective Broadband VoIP system that enables service providers to quickly roll out residential and business IP Centrex/Hosted PBX services. The Tornado System utilizes Intelligence-at-the-Edge architecture in which the central servers perform call management and billing functions whereas the customer premises equipment (CPE) devices, such as the Tornado M5 IP Phones, deliver IP Centrex/PBX functionality (e.g. call-on-hold, call-transfer, 3-way calling, etc). Due to its decentralized architecture, the Tornado System is highly fault-tolerant with no single point of failure.

SYSTEM COMPONENTS

- **VoiceMaster® VoIP Billing Platform with Tornado Service Package**, a robust billing and call management server that controls all elements of the Tornado System.
- **uniSwitch Softswitch**, an advanced VoIP softswitch that serves as a SIP registrar for the Tornado M5 IP Phones and offers multiple routing mechanisms to ensure high call quality at minimum cost.
- **Tornado M5 IP Phone**, a next-generation IP phone with complete set of IP Centrex features that offers to consumers and small businesses a cost-effective alternative to expensive PBX systems.

TORNADO SYSTEM ARCHITECTURE



Tornado

System

Intelligence-at-the-Edge-Architecture

The Tornado System features "Intelligence-at-the-Edge" architecture which has many advantages over the traditional "Intelligence-at-the-Core" architecture. A major difference between the former and the latter is that the "Intelligence-at-the-Edge" architecture utilizes inexpensive CPE devices that carry the system intelligence (e.g. call processing) at the subscriber premises. In a traditional architecture, all call intelligence resides in large and expensive PBX/Centrex switches located at the premises of the service provider.

High Fault-Tolerance

The Tornado System can operate in highly fault-tolerant environment where multiple proxy servers, such as uniSwitch Softswitch, communicate to the central call management server. The proxy servers are accessed via DNS addressing to allow for parallel call processing with load-balancing among servers. If one of the proxy servers becomes temporarily unavailable, the remaining servers will pick up the traffic even for existing calls.

Support for IP Centrex and PBX Functionality

The Tornado System supports both traditional and advanced IP Centrex/PBX features, such as call-on-hold, call-transfer, 3-way-calling etc. Unlike traditional systems, IP Centrex functionality resides on the Tornado M5 IP phones, reducing the load of the central server and increasing its call capacity. Because of the offloading of call processing functionality from the central server to the CPE devices, large Centrex deployments become more affordable as the cost of deployment is partly absorbed by the end users (through paying for the IP phones).

DID Number Distribution and Provisioning

The Tornado System features automated DID distribution and provisioning. Such functionality enables service providers to acquire DID segments and automatically assign them to the CPE devices of their subscribers. With assigned DID numbers, incoming calls are automatically routed to the corresponding extension so that outside callers can reach system subscribers directly.

Outsourced RTP/Voice Control

In a Tornado System, the central server does not provide IVR, RTP, or codec management functionality which reduces its load and increases the call capacity of the whole system. All resource intensive call processing functions are outsourced to the Tornado M5 IP Phones.

SIP Protocol Support with NAT Traversal

The Tornado System supports network address translation (NAT) traversal and can deliver IP Centrex services to subscribers located behind most residential and/or corporate firewalls. Such feature provides subscribers with universal and trouble-free connectivity from any location with high speed Internet access.

Automated Subscriber Management and Billing

The Tornado System offers advanced subscriber profile management and real-time call billing capabilities. It features an enhanced CRM interface which allows subscribers to create/modify/provision their accounts via a web browser. Additionally, the system includes the highly sophisticated VoiceMaster[®] billing engine which offers multiple billing models and unlimited pricing creativity.

Decentralized Voicemail

Tornado System offers decentralized voicemail functionality where each Tornado M5 IP Phone can accept, record and manage up to 80 voicemail messages. The advantage of Tornado System relative to traditional PBX systems, which store voicemails in a central server/location, is that subscribers have access to voicemail even in cases when the service provider's network is temporarily unavailable.

Unified Messaging and Call Forwarding

Tornado System offers improved user reach via the unified messaging and call forwarding capabilities of the Tornado M5 IP Phones. Upon receiving a voicemail, each IP phone can be configured to forward it to a preset email address. The Tornado M5 IP Phone can also be programmed to forward calls to alternative numbers so that users never miss a call.

Auto Peer Discovery

In a Tornado System, each Tornado M5 IP Phone can automatically discover its peers located within the same local area network (LAN). Such functionality allows LAN users to talk directly with each other for free as communications between the Tornado M5 IP Phones don't need to be facilitated (and charged for) by a service provider.



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