Qwest IP Voice Services Guide

- **OneFlex® IP Long Distance Service**
- **OneFlex® IP Toll Free Service**

Internet Protocol ("IP") VOICE SERVICES

1.0   General Service Descriptions

Qwest OneFlex® IP Long Distance (outbound from the customer) allows Qwest customers to terminate traffic to the Public Switched Telephone Network ("PSTN"), domestically and internationally, using an IP-based interface. Customers must deliver all traffic to Qwest using Voice over Internet Protocol ("VoIP") in Session Initiation Protocol ("SIP") or H.323v4 format. **These Services do not support local services, 911, E911, operator services, local number portability or directory listings. VNS, PAC and VPAC are not supported at this time.**

Qwest OneFlex® IP Toll Free service (inbound to the customer) allows Qwest customers to receive 8XX toll free traffic from the domestic PSTN, using an IP-based interface. Customers must receive all traffic from Qwest using VoIP in SIP. These services support the 8XX features including enhanced services. **These Services do not support local services, 911, E911, operator services, local number portability or directory listings. Transfer and Release, is not supported in the initial release.**

2.0   Applicability of Technical Specifications

The specifications in this section of the Qwest IP Voice Services Guide provide the main technical requirements that customers must satisfy in order to use:

- Qwest OneFlex® IP Long Distance Service
- Qwest OneFlex® IP Toll Free Service.

Note: additional technical requirements apply; this document presents the core requirements.

As customers share Qwest resources utilized in providing these IP Voice Services, all traffic must comply with these requirements so that other customers using Qwest IP Voice Services are not adversely impacted. Qwest reserves the right to refuse to accept, suspend or limit any or all traffic that does not satisfy these requirements or that Qwest believes is adversely affecting other customers or the Qwest network.   Qwest may alter the specifications of the IP Voice Services from time to time in order, among other reasons, to keep pace with market developments. Such alterations may impact the specific technical requirements that customers must satisfy in order to continue to use IP Voice Services.

2.1.   Technical Requirements:

2.1.1.   OneFlex® IP Long Distance Service

Customer traffic must utilize SIP or H.323 for VoIP signaling and satisfy these primary specifications set forth in each of the following IETF Requests for Comments ("RFCs"):

- IP – RFC 791
- User Datagram Protocol ("UDP") - RFC 768
- Transmission Control Protocol ("TCP") - RFC 793
- Real-Time Transport Protocol ("RTP") and Real-Time Transport Control Protocol ("RTCP") – RFC 1889

ITU-T H.323 family of standards is required for H.323 interface.

Note: Other specifications may be required beyond those listed here.

2.1.2. OneFlex® IP Toll Free Service

Customer traffic must utilize SIP for VoIP signaling and satisfy these primary specifications set forth in each of the following IETF RFCs:

- IP – RFC 791
- UDP - RFC 768
- TCP - RFC 793
- RTP and RTCP – RFC 1889

Note: Other specifications may be required beyond those listed here.

2.2   VoIP Signaling: Qwest accepts the following signaling protocols:

SIP, RFC 3261 with Session Description Protocol, RFC2327
- UDP transport only
- Customers must send OneFlex Long Distance Service or accept OneFlex Toll Free Service telephony tones from Qwest on a per call basis in any one of the following methods:
    - In-band signaling (G.711 only)
    - Out-of-band signaling using RFC2833 (G.729 only)
    - Out-of-band signaling using SIP INFO (G.729 only)
    - ILDC is not supported
    - SIP redirect is not supported

H.323v4 OneFlex Long Distance Service only)

- TCP transport only
- Must utilize one, and one only, of the following methods:
    - Direct signaling from customer gateway ("GW") to Qwest GW
    - Gatekeeper ("GK") routed model where all signaling is sent from the customer GK, but the media is sent from a GW with a separate address
    - Location request ("LRQ") model where customer GK sends an LRQ to initiate call followed by call setup from customer GK
- H.323 Faststart only
- H.245 tunneling is preferred
- Allows for in-band signaling
- Out-of-band signaling via H.225 facility messages

Other Signaling Requirements

- Qwest allows for signaling to <u>originate</u> from up to five source IP addresses for OneFlex® IP Long Distance Service. Each address must be an IP address and not a fully qualified domain name ("FQDN"). Customers must provide Qwest with all of their initial IP addresses during the order process. Any changes to these addresses must be sent to your Qwest Account Manager in writing. Customers requesting or adding more than five total IP addresses must receive permission from the Qwest VoIP product manager.
- Qwest allows for signaling to <u>terminate</u> to only one signaling IP public address <u>per IP trunk group</u> for OneFlex® IP Toll Free Service. A maximum of five signaling addresses are permitted (each would be dedicated to a separate IP trunk group). The address must be an IP address and not a FQDN. Customers must provide Qwest with their IP address during the order process. Any changes to this address must be sent to your Qwest Account Manager in writing. Customers requesting or adding more than five total IP addresses must receive permission from the product manager.
- Customers' signaling traffic will comply with the signaling rate (calls per seconds) specified below (see section 4.0), except as noted.

- The dialed number (translated 800 number per customer's request at order time for OneFlex Toll Free Service) in the signaling will meet the following standard:
  - Passed in the request URI field and will be a minimum of one digit and no more than 10 digits
  - Customer must specify what they want at a per-route level in the order form
- The dialed number in the signaling for OneFlex Long Distance Service must meet one of the following:
  - U.S. Domestic destinations using 10 digit (E.164) numbers for U.S. Domestic destinations
  - International phone numbers (E.164) using a leading 011 or +011 string
  - U.S. Domestic Toll free using 10 digit (E.164) numbers
- Qwest supports p-asserted-identity for privacy (IETF RFC 3325).
- For OneFlex Toll Free Service, Qwest sends Originating Line Information ("OLI") in SIP field From: field
  Example OLI Header:
  From: <sip:9998887777@10.10.10.10:5060;**isup-oli=0**>;tag=gK0e20f0fe
- Qwest does not initiate session timers
- Qwest default is to not globalize numbers in SIP fields

3.0   VoIP Audio Encoding:

VoIP audio will be delivered by Qwest for OneFlex Toll Free Service, and OneFlex Long Distance Service using RTP/RTCP, UDP over IP protocol.

SIP does not limit the number of destination IPs for media. All addresses must be public IP addresses and not FQDNs.

For H.323, Qwest allows for audio (RTP streams) to originate from up to five source IP addresses. Each address must be an IP address and not an FQDN. Customers must provide all of their initial IP addresses to Qwest during the ordering process. Any changes to these addresses must be sent to your Qwest Account Manager in writing.

Qwest IP Voice Services support the following voice CODECs:
- G.711 ulaw
- G.711 alaw
- G.729A (no silence suppression)* or G.729AB (silence suppression)**
- No other CODECs (such as G.723, G.726 or GSM) are supported

SDP for G.729 must comply with RFC3555. If customer requests "G.729" Qwest formats that as G.729AB.

Examples:

*G729A Example:
m=audio 10964 RTP/AVP 18
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=sendrecv
a=ptime:20

**G729AB Supported example:
m=audio 10946 RTP/AVP 18
a=rtpmap:18 G729/8000
a=sendrecv
a=ptime:20

The supported payload sample sizes are 10, 20, and 30 ms. Qwest recommends customers use 20 ms.

Customers must support G.711 / G.729 CODEC auto-negotiation and fallback for FAX.

T.38 fax is supported with G.729 Codec.

Customer must supply on their order form their preferred codec list and payload sample size per codec.

4.0 Maximum Number of Calls per Second

Table 1 - Maximum number of calls per second per source/destination address pair based on the maximum number of sessions ordered at provisioning

Protocol	Number of Simultaneous Calls Ordered from Qwest	Sustained Call Rate in Calls per Second
SIP	0-500	3
SIP	500-1000	6
SIP	1000-2000	11
H.323	0-200	2
H.323	200-500	3
H.323	500-1000	6

- Customer traffic is policed during call setup to the applicable Number of Simultaneous Calls the customer has ordered.
- Qwest may, in its discretion, accept or deliver traffic above the policed levels set forth in Table 1 if capacity is available on the Qwest network ("Increased Traffic Levels"). In the event Qwest attempts to accept or deliver Increased Traffic Levels, Qwest shall have no continuing obligation to do so and may, without notice, cease to accept or deliver such Increased Traffic Levels.

5.0 Access to Qwest IP Network:

Customers may access Qwest IP Voice Services using either of the following:
- Qwest provided IP transport (e.g., Qwest iQ Networking®, legacy DIA) [some customers will have legacy DIA in place and that does not need to be upgraded to iQ for this product]
- Public Internet Access

For customers utilizing Qwest provided IP transport services (such as Qwest iQ Networking service), the following number of sessions limitations by IP transport speed apply:

Customer iQ Bandwidth	Maximum Calls G.711 (20 ms sample)	Maximum Calls G.729 (20 ms sample)	Maximum Calls G.729 (30 ms sample)
DS-1	14	33	45
DS-3	400	970	1330
Fast Ethernet	900	2100	2980
OC-3	1400	3,400	4630

Table 2 - Maximum number of calls based on access bandwith

For customers using public internet access, maximum calls per bandwidth is not a helpful calculation because the public internet is "best effort." Access is constrained to the contracted number of sessions.

6.0   Document Change Management:

Qwest reserves the right to amend any of the provisions contained in this IP Voice Services Guide for any reason, including without limitation, in order to improve Qwest network efficiency, to address security threats, or to comply with applicable law or regulation. Any such amended provision will be effective 30 days after it is posted to the Qwest website as a part of the IP Voice Services Guide.

7.0   Glossary:

- Dialed number – the output digit string (1 – 10 digits) after applying the customer's translation to the originally dialed 800 number
- Dialed number identification service – the original 800 number dialed by the caller is delivered in the signaling/messaging to the customer. Oftentimes used by ACD systems to distinguish call types when multiple 800 numbers are routed to the same destination.
- IP Trunk Group – a routable and CAC-controlled entity for VoIP traffic destined to a customer's IP endpoints.