

What Causes VoIP Clipping and Drops?

Clipping occurs when words are cut up in a conversation and you only hear half of the word: For example, you hear “-osis” and are unsure if the doctor on the other end said “halitosis” or “trichinosis.”

Drops occur when an entire word is dropped which may affect the meaning of a sentence: For example, “The MRI showed that the (benign) brain tumor was below the cerebellum.” The dropped word, “benign,” substantially changes the meaning.

Clipping and drops in a VoIP conversation come from two potential sources:

1) Dropped packets.

Finding where and why packets were dropped can be challenging, as that they can be lost in many different locations, for a wide variety of reasons. Some of the primary reasons that packets are lost in a network include:

- **Bandwidth limited links and no QoS.** If a link becomes completely saturated, it will drop packets that it can't send. If there is no quality of service, or misconfigured QoS, the VoIP packets will be dropped.
- **Misconfigured interfaces.** A half-duplex link will cause packet loss since VoIP is a full-duplex communications process.
- **Microburst link floods and no QoS.** If a low-utilization link has occasional spikes of 110% utilization for 10-second periods, the additional 10% utilization will be dropped. Detect this by tracking the Deferred Transmissions and outbound discards counters.
- **Underpowered network equipment.** A low-end router unable to process the packets that are sent to it, may drop packets. Monitoring the router CPU can help.
- **Cabling faults.** Many organizations have cabling that is of unknown quality or capability. This can lead to FCS errors and carrier sense errors.

2) Out-of-order packets.

Out-of-order packets are packets that were successfully delivered to the destination device, but were not in serialized order. This can occur when there are multiple paths to the destination and incorrect load balancing is employed. Per-flow load balancing should be used for all redundant links and equal cost routing for layer-3 should not be used.

PathSolutions TotalView is built to analyze all of the above conditions and provide plain-English answers to detected faults.

