How Texting Works

Introduction

Short Message Service (SMS), or more commonly known as texting, has played a major role in our society today. As prevalent as this form of technology is, it is not widely understood how the technology functions.

Texting is a form of mobile communication that allows mobile phone users to communicate using short messages. It allows users to communicate quickly and effectively using their mobile phones using 160 characters or less. Since its inception in 1990 and its infrastructure completion in 1998, texting has changed the face of communication for the information age.

Process

Process Overview

The process of sending and receiving a text is fairly straightforward. A mobile phone enters in a destination phone number, writes a message, clicks send, and the user on the other end receives the message. Although this may seem simple, there are a great deal of components that go in to making this technology function in the way that it does.

List of Components

There are many components that are used in the process of sending and receiving a text. This list will breakdown each one.

1. **Home Location Register (HLR)**- Database of information about a network’s users.
2. **Mobile Station (MS)**- Any device that can be used to send or receive a text message.
3. **Mobile Switching Center (MSC)** - Center that routes the message to the correct device for delivery.
4. **Short Message Service (SMS)** - A message that can be sent between two mobile stations.
5. **Short Message Service Center (SMSC)** - Center responsible for storing and forwarding the SMS messages.
6. **Visitor Location Register (VLR)** - Allows a center to get information about a visiting device on the network.

### Mobile Stations and External Short Messaging Service Entities

A text message starts with the mobile station. Every person who has sent or received an SMS message has access to one of these devices. The mobile station is any device that is capable of sending or receiving the short message. These devices are most commonly cellular phones but can also include PDAs, or wirelessly connected computers.

### Short Message Service Centers

The short message service center plays an integral role in the delivery of a text message. It is responsible for two main functions: storing, and forwarding of the text messages. Storing a message is important when the mobile station on the other end can not receive the message.

![Diagram of Short Message Service Centers](http://services.eng.uts.edu.au/userpages)

For example, if the receiving phone is powered off or its storage is at capacity, the short message service center has the capability of saving that message until it is able to be delivered. This is one of the key things that makes texting so successful.

Forwarding is what allows the user on the other end of the message to ultimately receive the sent text message. This is done using a mobile switching center (MSC) which is integrated in the short message service center.

Essentially, the MSC acts as a director for each message that comes through the center. It does this by using either the Home Location Register (HLR) or the Visitor Location Register (VLR).

The Home Location Register stores the data relevant to each network provider’s subscribers. With this data, the MSC is able to access the mobile station’s location, status, and routing information. This allows for the short message service center to be able to access that particular mobile station. In addition to storing this data for the center, the HLR alerts the center when a previously unsubscribed device is back up on the network (i.e. a phone is turned back on). This will allow for the stored messages for that device to be sent over once it is connected to the network.
The Visitor Location Register is important for a user that is visiting another network. The VLR will allow that user to have their information maintained on the short message service center while they roam in the network. This way, even if the user is not in the Home Location Register, the VLR will ensure that they receive their messages.

**Overall Process Overview**

The overall step-by-step process for sending and receiving a text message is as follows:

1. **Step 1.** The user powers on their Mobile Station and registers with the network.
2. **Step 2.** The user sends the SMS to the Short Message Service Center (SMSC).
3. **Step 3.** The SMSC asks the Home Location Register for the information about the sender.
4. **Step 4.** The SMSC sends the SMS to the Mobile Switch Center (MSC).
5. **Step 5.** The MSC asks the Visitor Location Register for information about the recipient of the message.
6. **Step 6.** The MSC receives routing information from the VLR and sends the message to the receiving Mobile Station.
7. **Step 7.** The outcome of the operation is returned to the SMSC as an acknowledgment that the message was received.

**Conclusion**

Texting has changed the way that people communicate with each other. Talking on the phone is becoming increasingly less popular while texting is on the rise. Understanding the process of texting and the technologies that make it work is crucial to the advancement and adoption of it.
