the SCO slots in the two piconets do not overlap, but as the clocks of the two piconets' Masters drift, the two SCO links will move until they overlap one another.

5.7 MASTER / SLAVE ROLE SWITCHING

Bluetooth allows any device to request a switch in roles with respect to another device it is communicating with. For example, a Master in an existing piconet might allow itself to be paged and connected to a new device and then switch between Slave/Master (temporarily imposed by the paging procedure) and Master/Slave to integrate the new Slave into its piconet. This is accomplished with a Master/Slave switch and is particularly useful in situations where a connection has just been established by a device which normally wishes to be a Slave, such as where a mobile computing device enters a piconet controlled by a LAN access point.

The mechanism essentially involves the slave sending its FHS packet to the Master; the Master takes on a CLK offset to match the Slave's CLKN, while the Slave switches to using its own CLKN, and each device swaps access codes. The new Master also sends an LMP message, which contains the lower part of the Bluetooth CLK not contained in the FHS together with the sub-slot offset information in μs to allow the new Slave to fully synchronise its timing.

5.7.1 Messaging

Figure 5–13 shows the sequence of messages exchanged when a Slave becomes a Master by initiating a Master / Slave switch. The Master side can also request the role switch.The LMP_switch_req message also gives the instant when the switch will happen.

The Slave gives the Master detailed information on its clock, so that the Master can move onto the Slave's timing. An LMP_slot_offset message is used by the Slave to pass this information to the Master.

In version 1.1 of the Bluetooth core specification, the baseband also describes a mechanism by which a Slave which is becoming a master can acquire any other slaves which belonged to the former Master. The new master sends an LMP_slot_offset message to tell the slave the new timing it should us, the master then sends an FHS, the salve responds with an ID and both devices move onto the new master's hop sequence. The procedure is similar to a master and slave swapping roles, except that the TDD switch is not needed as the slave is already on the correct TDD timing.

LMP does not provide any messages to tell the new Master the active member addresses of the old Slaves, or to pass on information about Slaves in Hold, Park or Sniff modes. For the new Master to attempt to acquire the Slaves of the old Master, it has to poll all seven active member addresses using the old Master's hop sequence and timings, and see if any respond.

It is worth noting that the Host Controller interface does not provide commands to control the acquisition of slaves from a former master after a role switch.

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By Jennifer Bray and Charles Thurman

Prentice-Hall, Inc.
Upper Saddle River, NJ 07458

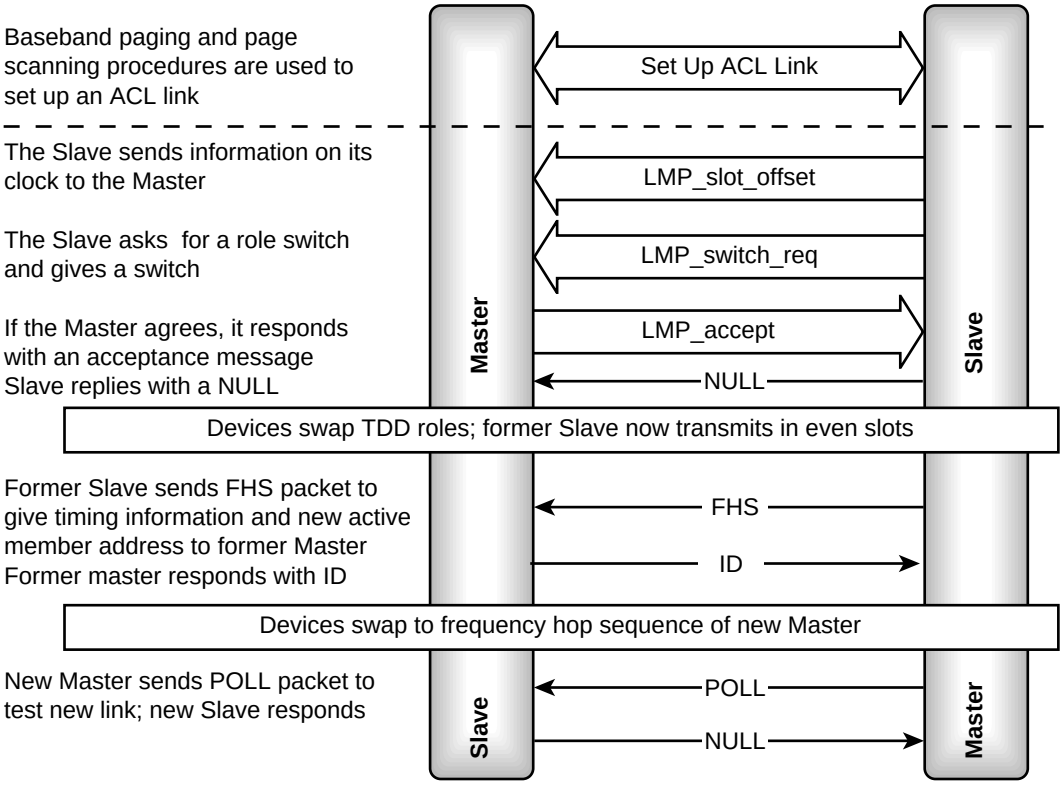

Figure 5–13 Message sequence chart for Master / Slave switch.

In practice, the acquisition of Slaves from a Master is unlikely to be a problem, as the main use for a Master/Slave switch is to allow a device to join a piconet quickly by paging, then hand control of piconet back to the former Master of the piconet.

5.7.2 Uniting Scatternets with Role Switch

The devices linking a scatternet are present on more than one piconet and have to time share, spending a few slots on one piconet and a few slots on the other. Each device has its own independent clock, and when devices join a piconet, they track the timing of the piconet's Master by keeeping track of the offset between their clock and the Master's clock. This means that when devices are present on more than one piconet, there will be some slots which cannot be used (for a fuller description of scatternet timings and how to manage them, refer to Chapter 19).

Sometimes it is desirable to have a device join a piconet as a Master as shown in Figure 5-15. Consider a LAN Access Point (LAP). It does not know which devices in the area wish to connect, and it would be wasteful of its resources to constantly poll devices