

Best Practices for Partially Connected Networks

The advent of mobile computing presents the application developer with unique challenges not normally encountered in traditional wired networks. Perhaps the greatest of these challenges is the partially connected network. The classic definition of a partially connected network is *a network topology where intermittent connections are expected*. An intermittent connection is defined as any connection where there is no guarantee of a connected path from source to destination.

There are many causes of intermittent connections. The most common are:

- **User Intervention:** The case where a user either disconnects the device from the network or removes the device from the docking / communications cradle.
- **Network Configuration:** Mobile devices may require additional time to acquire an IP address, and IP addresses are often not assigned during device power-up (i.e., an IP address may not be assigned until the device is docked in the communications cradle).
- **Loss of intermediate connections:** Intermediate connections can be interrupted by power outages, ESD events, etc. Often these interruptions will not impact the source or destination devices. However, the communications link will become invalid.
- **Loss of RF coverage:** RF networks are particularly susceptible to environmental and geographic limitations not seen in traditional wired networks.

To ensure robust communications in partially connected networks, developers should adhere to the following best practices:

- ✓ Programmatically verify the existence of the desired link.
- ✓ Avoid the use of blocking calls when opening network connections.
- ✓ Monitor all network / connectivity events during the entire communications session.
- ✓ Design robust retry logic to ensure recovery from intermittent loss of connectivity.
- ✓ Validate the data transfer prior to ending the communications session.
- ✓ Never assume a fully connected path from source to destination.

Applications that adhere to these best practices can take full advantage of the power of mobile computers, while avoiding the pitfalls of partially connected networks.