

NFC Forum Announces Technology Architecture

The group says its first standards will be released during the third quarter.

By Mary Catherine O'Connor

June 7, 2006—Near-field communications (NFC) technology is being commercially deployed by a Frankfurt, Germany, public transit authority. The technology has been tested—or is currently being tested—by a long and growing list of merchants, payment networks and other service providers, including Atlanta's Philips Arena.

Now the technology, which enables RF communication between mobile electronic devices for applications such as payments or data exchange, is getting closer to standardization. This week, the NFC Forum, an association promoting the adoption of NFC technology, announced its technology architecture. Once complete, the architecture will include protocols for how NFC devices will establish communication, exchange data and interoperate. The architecture also lists the type of RFID tags all NFC-compliant devices will need to be able to read.

The announcement is important, says Erik Michielsen, director of RFID and machine-to-machine research at ABI Research, because it shows "substance and progress" from the NFC Forum. "In terms of substance, the Forum is creating the pieces that are necessary to make NFC applications [contactless payments, data exchange or device pairing] a reality," he says. According to Michielsen, the emerging specifications and NFC Forum working groups are addressing security and interoperability issues. The Forum, he adds, is "putting the framework in place to enable realistic market development" of NFC technology.

The announcement that NFC standards are forthcoming also shows progress by the NFC Forum toward its goal of enabling NFC adoption, Michielsen notes, and shows "a lot of buy-in" from various member companies.

More than 80 firms currently make up the NFC Forum, reports Gerhard Romen, the organization's marketing committee chairman and Nokia's head of global market development. These include founding members Nokia, Philips and Sony, as well as sponsoring members MasterCard International, Microsoft, Motorola, NEC, Samsung, Texas Instruments and Visa International.

Early this year, a number of telecommunications firms, including Sprint, SK Telecom and Swisscom Mobile, joined up. Mobile phones can easily be designed to function as NFC devices and take advantage of near-field communications applications. Therefore, the support of mobile communications carriers is vital to the success of NFC technology in business and consumer applications, says Michielsen, because carriers play an essential role in getting NFC-enabled devices into users' hands.

The technology architecture is based on three main modes of operation: peer-to-peer, read-write and card-emulation. NFC devices use the peer-to-peer mode for data transfer between devices, such as passing contact information or an electronic business card from one device to another—for example, between an NFC-enabled cell phone and an NFC-enabled PC. They can also use this mode for initially pairing, or linking,

two devices that can then communicate via Bluetooth or another protocol. With read-write mode, an NFC-enabled device can access data from an RFID-enabled object, such as a "smart poster" with an embedded RFID tag that allows users to download a URL for a movie trailer. In the card-emulation mode, an NFC-enabled device emulates a contactless payment card and can be used to purchase goods and services.

Each of these modes requires that NFC devices use a common data format for communications. The first of these format specifications—the NFC data-exchange format (DEF) and NFC record-type definition (RTD)—will be released in the third quarter, according to Romen. "The record data definition," he explained during an NFC Forum teleconference on Monday, "lets NFC devices talk to each other, with the data-exchange format establishing the grammar that they will use.

These two specifications will standardize how NFC devices operate in the read-write mode. Three other specifications, due some time after the third quarter, describe how NFC devices in read-write mode will conduct specific transactions. There will be a text RTD for exchanging records that include plain text; a smart poster RTD for using an NFC device to pull text, audio or other content from a smart poster; and a uniform resource identifier (URI) RTD for exchanging records that refer to Internet resources.

These specifications are currently being moved through a balloting and ratification process among NFC working groups. Once they are approved, the Forum will work to finalize specs for a logical link control protocol, which defines how two NFC-enabled devices link in peer-to-peer mode, as well as the protocol for card-emulation mode.

Additionally, the organization announced that all of its standards are being built upon an initial set of high-frequency (13.56 MHz) RFID tag standards: ISO 18092, ISO 14443-A and 14443-B standards, along with Sony's FeliCa. All NFC devices will need to be able to read and write to tags using these protocols, says Romen. He could not confirm what type of licensing plan will be associated with the NFC standards, stating only that "the working groups are currently working on the usage guidelines [for the standards]."

NFC Forum's interest is reportedly in making the standards easy for any provider or manufacturer of an NFC device or system to adopt. Such companies will not be required to be NFC Forum members, Romen points out, adding that the specific licensing guidelines will be ironed out following a meeting of the Forum in September. He could not say at this point whether there will be fees to access the written protocol specifications.

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