



ADVANCING NEAR
FIELD COMMUNICATION
TECHNOLOGY

Putting NFC Forum Specifications to Work



16 March 2011



Ruth Cassidy

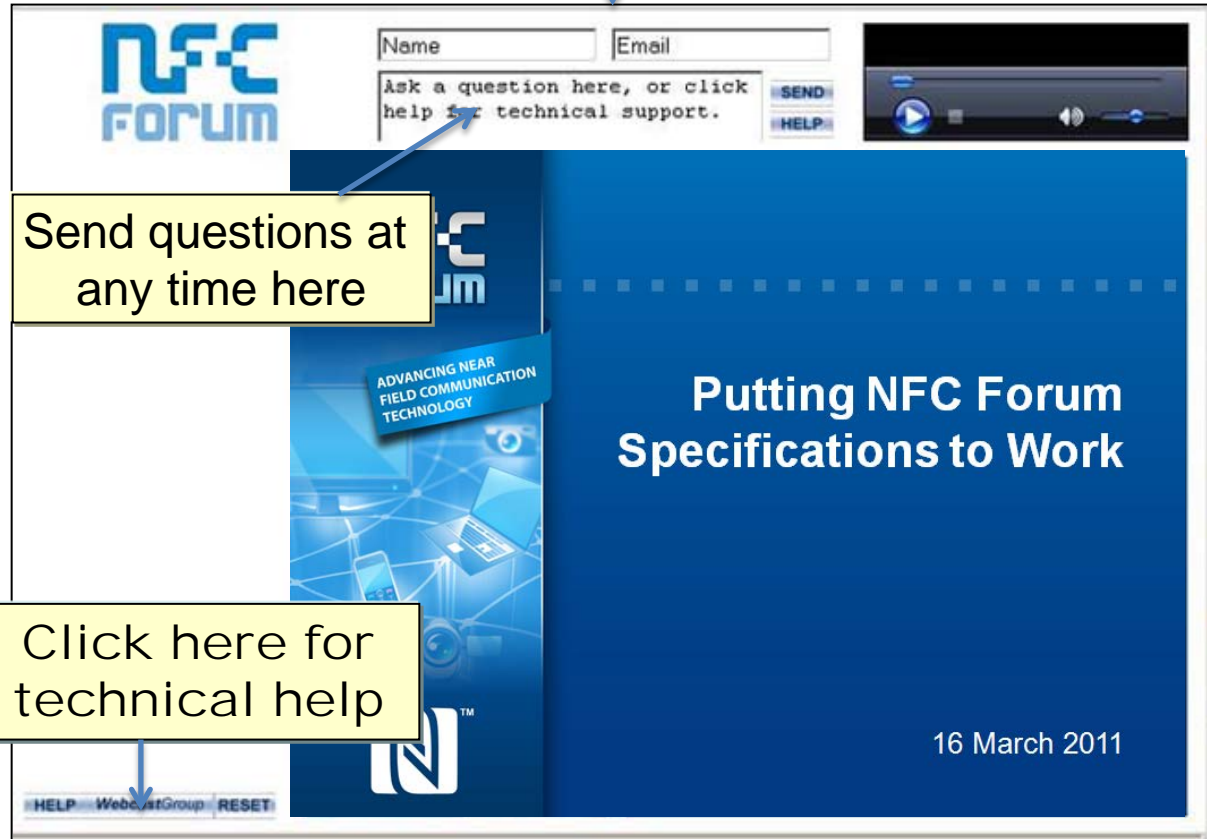
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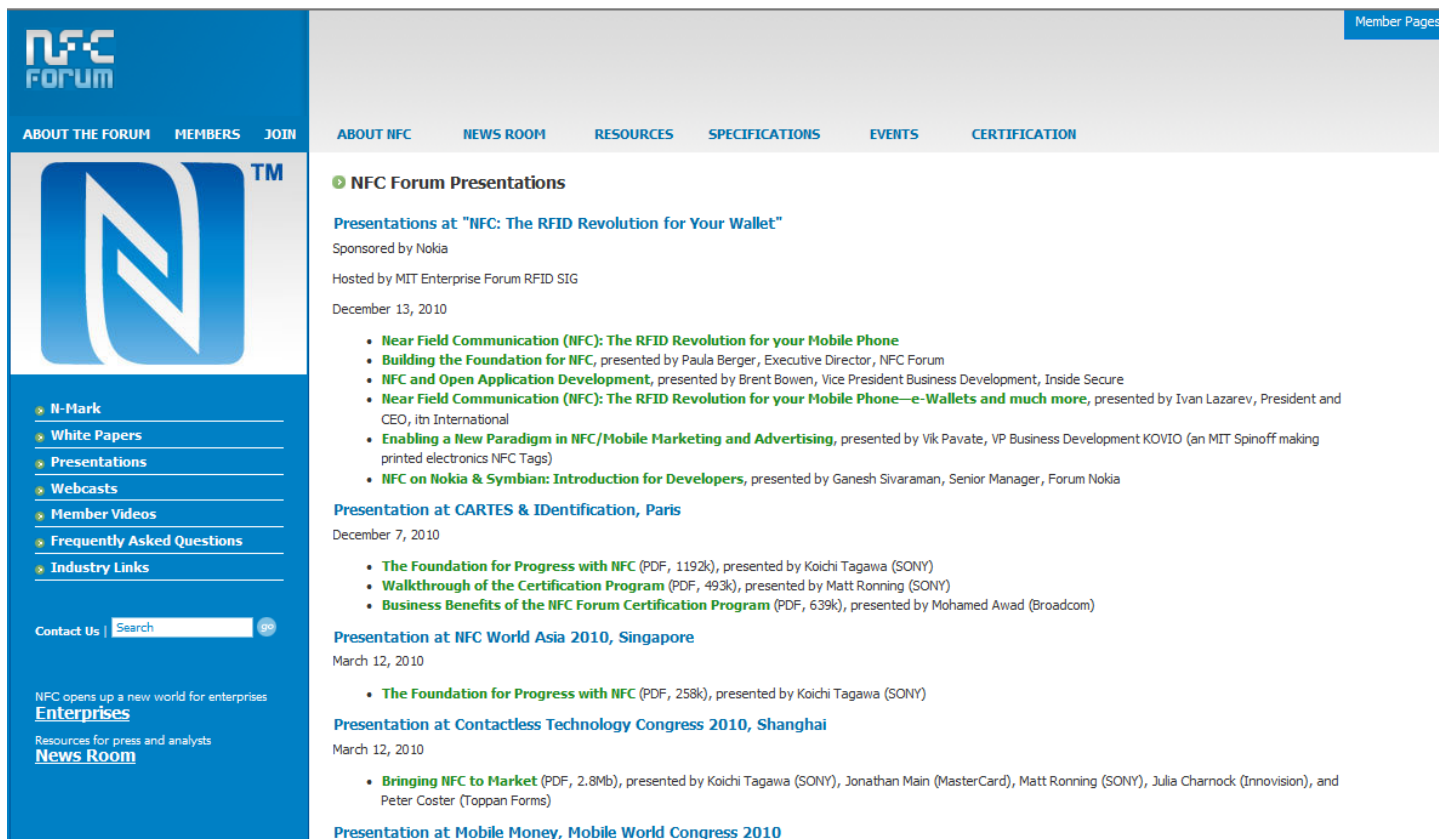
Audio may come through your computer or you may call in

- Use your computer mixer to adjust master volume
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The screenshot shows the NFC Forum website interface. At the top left is the NFC FORUM logo. To its right are input fields for 'Name' and 'Email', followed by a text area containing the prompt 'Ask a question here, or click help for technical support.' and buttons for 'SEND' and 'HELP'. A yellow callout box with the text 'Send questions at any time here' has an arrow pointing to the text area. In the top right corner, there is a black audio control slider with a play button and volume icons. A yellow callout box with the text 'Click here for technical help' has an arrow pointing to the 'HELP' button. The main content area features a blue background with the text 'Putting NFC Forum Specifications to Work' and the date '16 March 2011'. At the bottom left, there are links for 'HELP', 'WebcastGroup', and 'RESET'.

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NFC FORUM Member Pages

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NFC Forum Presentations

Presentations at "NFC: The RFID Revolution for Your Wallet"
 Sponsored by Nokia
 Hosted by MIT Enterprise Forum RFID SIG
 December 13, 2010

- **Near Field Communication (NFC): The RFID Revolution for your Mobile Phone**
- **Building the Foundation for NFC**, presented by Paula Berger, Executive Director, NFC Forum
- **NFC and Open Application Development**, presented by Brent Bowen, Vice President Business Development, Inside Secure
- **Near Field Communication (NFC): The RFID Revolution for your Mobile Phone—e-Wallets and much more**, presented by Ivan Lazarev, President and CEO, itn International
- **Enabling a New Paradigm in NFC/Mobile Marketing and Advertising**, presented by Vik Pavate, VP Business Development KOVIO (an MIT Spinoff making printed electronics NFC Tags)
- **NFC on Nokia & Symbian: Introduction for Developers**, presented by Ganesh Sivaraman, Senior Manager, Forum Nokia

Presentation at CARTES & Identification, Paris
 December 7, 2010

- **The Foundation for Progress with NFC** (PDF, 1192k), presented by Koichi Tagawa (SONY)
- **Walkthrough of the Certification Program** (PDF, 493k), presented by Matt Ronning (SONY)
- **Business Benefits of the NFC Forum Certification Program** (PDF, 639k), presented by Mohamed Awad (Broadcom)

Presentation at NFC World Asia 2010, Singapore
 March 12, 2010

- **The Foundation for Progress with NFC** (PDF, 258k), presented by Koichi Tagawa (SONY)

Presentation at Contactless Technology Congress 2010, Shanghai
 March 12, 2010

- **Bringing NFC to Market** (PDF, 2.8Mb), presented by Koichi Tagawa (SONY), Jonathan Main (MasterCard), Matt Ronning (SONY), Julia Charnock (Innovision), and Peter Coster (Toppan Forms)

Presentation at Mobile Money, Mobile World Congress 2010

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Today's Speakers



Peter Coster

NFC Forum Ecosystem Development Working
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Product Planning and Marketing Leader, Toppan
Forms

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Jonathan Main

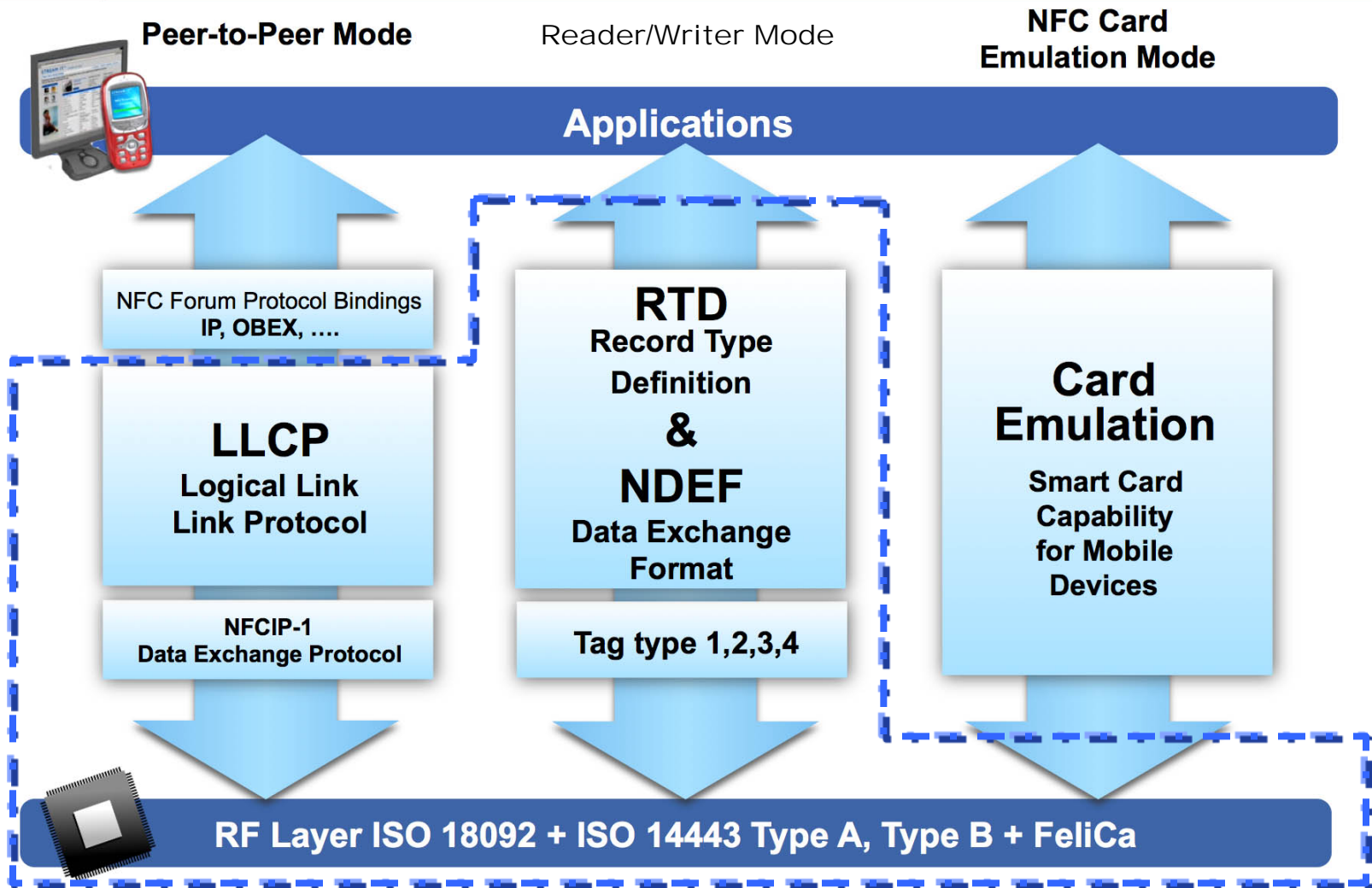
NFC Forum Technical Committee Chairman

Business Leader, Emerging Payments,
MasterCard Worldwide

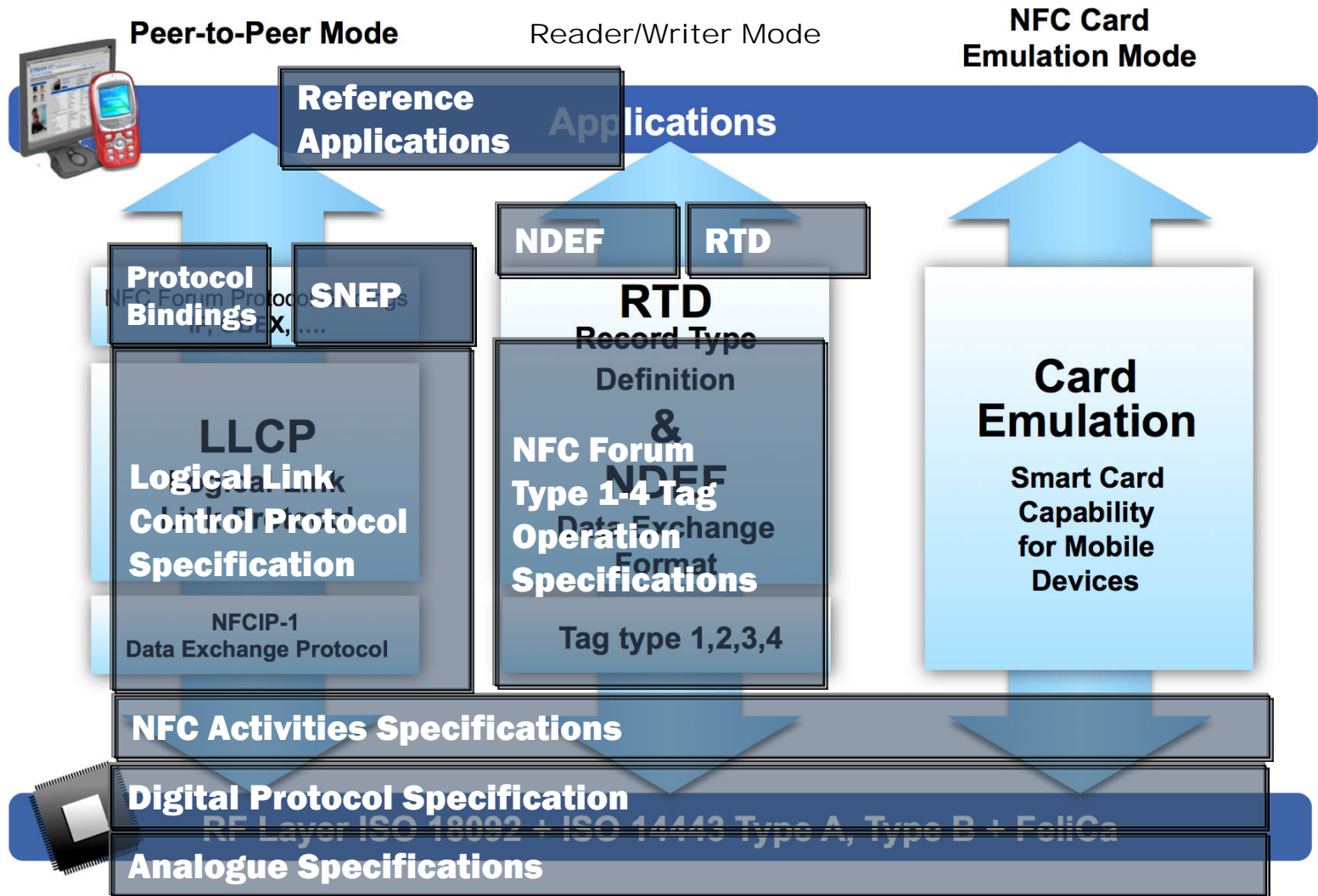
techcomm-chair@nfc-forum.org

- NFC Forum Technology Architecture
- Device Level Specifications
 - Digital Protocol
 - Activity
 - Logical Link Protocol
 - Tag Type
- Application Level Specifications
 - NFC Data Exchange Format
 - Record Type Definition
 - Connection Handover
- What's Coming Up
- Q&A

NFC Forum Architecture



NFC Forum Technology Architecture

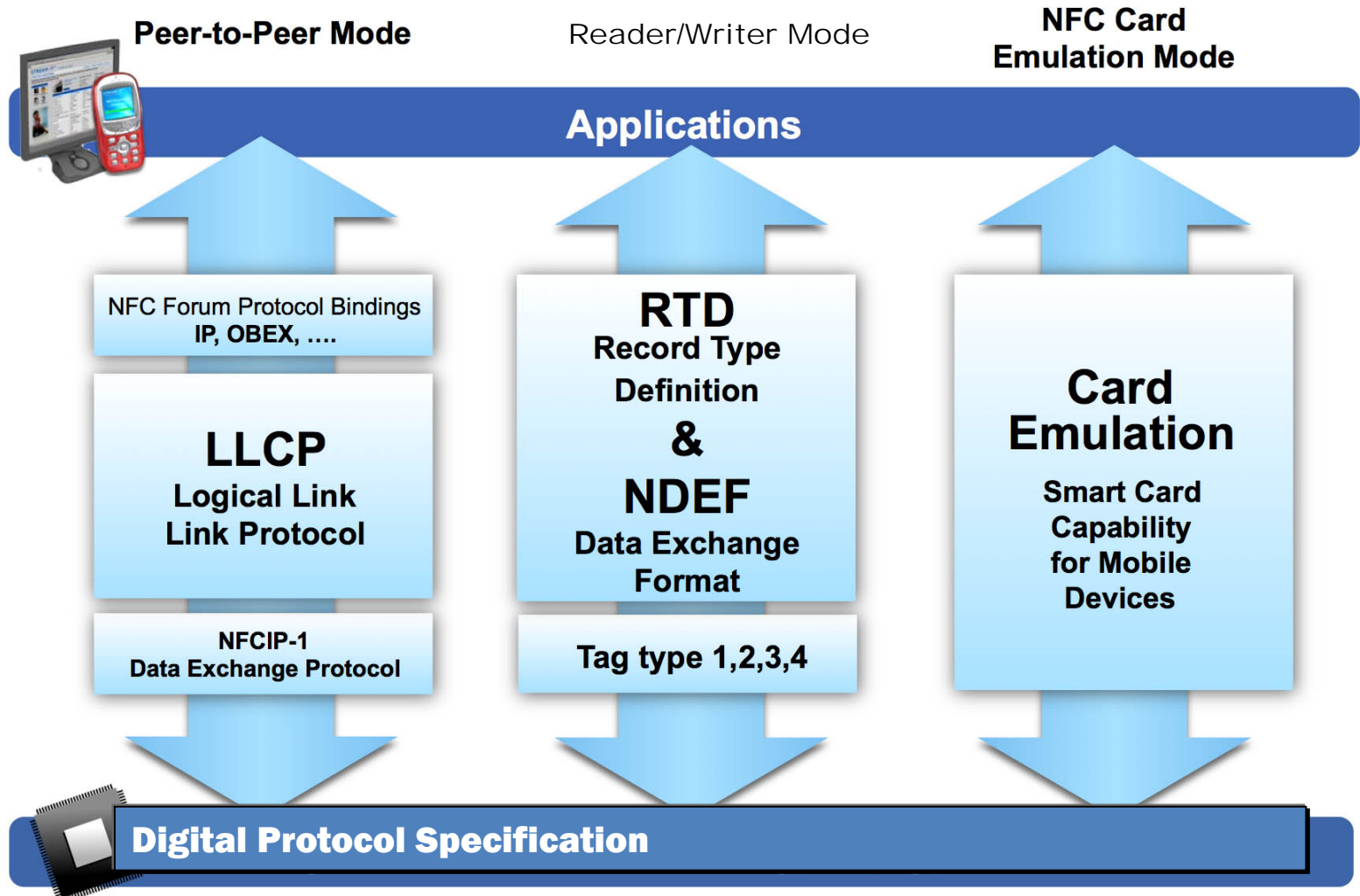


Device Level Specifications

Digital Protocol Specification

- Aim of specification:
 - Define the “building blocks” to set up and maintain an NFC connection between two devices
- How it does this:
 - An implementation specification of NFCIP-1 incorporating ISO/IEC14443 and FeliCa
 - Narrows down options in the base specifications to ensure interoperability
- Implementation issues:
 - Typically implemented in NFC chipsets and firmware
- Where it is based in the device architecture:
 - RF layer

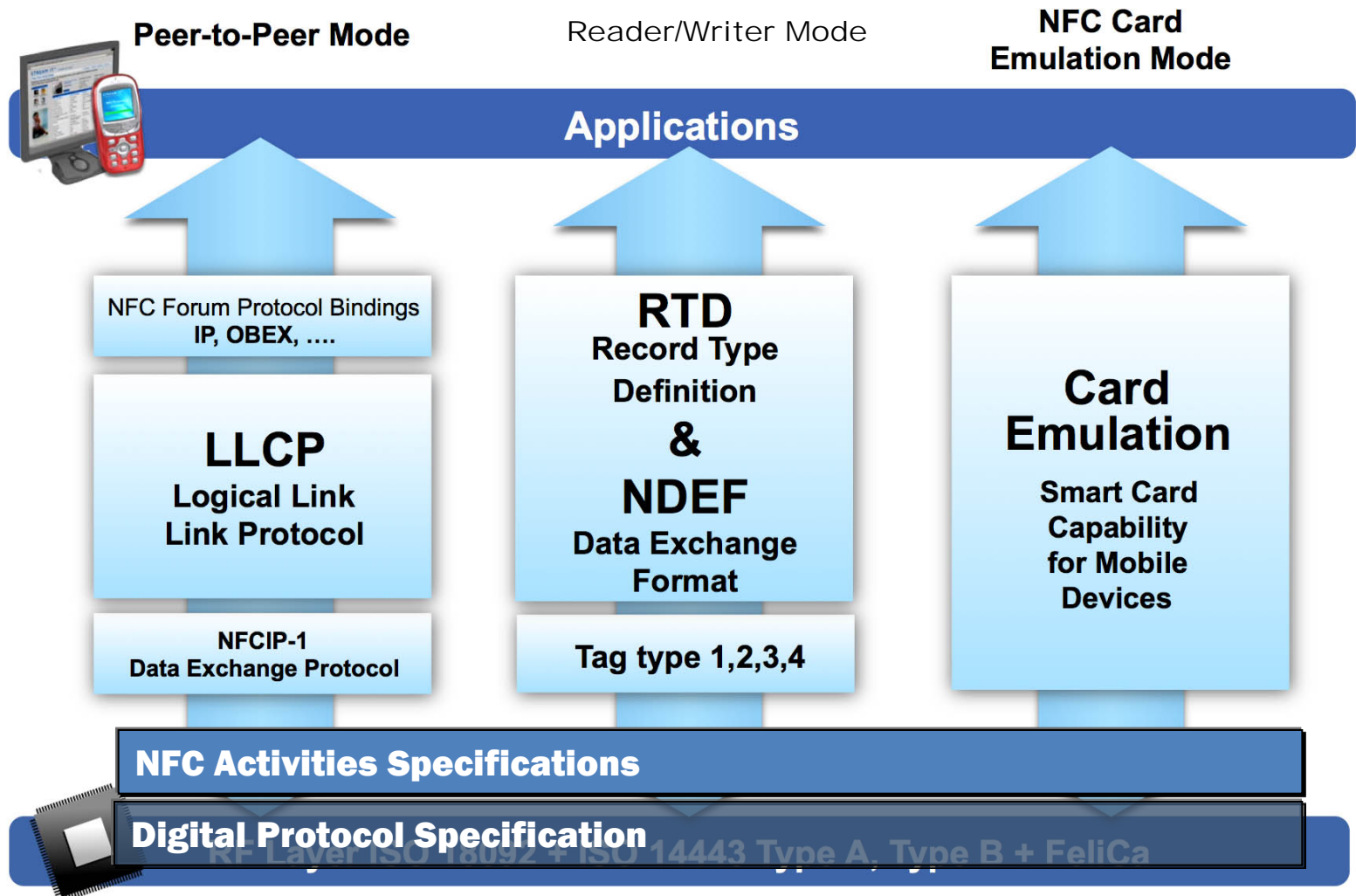
NFC Forum Technology Architecture



Activity Specification

- Aim of specification:
 - How to use the building blocks of the Digital Protocol specification for particular use-cases
- How it does this:
 - Defines a number of profiles that define the sequence of activities required to fulfill a set of use-cases.
 - E.g., establishing a peer-to-peer connection to another NFC device, reading NDEF data from a tag
- Implementation issues:
 - Possible for a device to implement proprietary profiles to support specific use cases
- Where it is based in the device architecture:
 - Defines profiles of the Digital Protocol specification

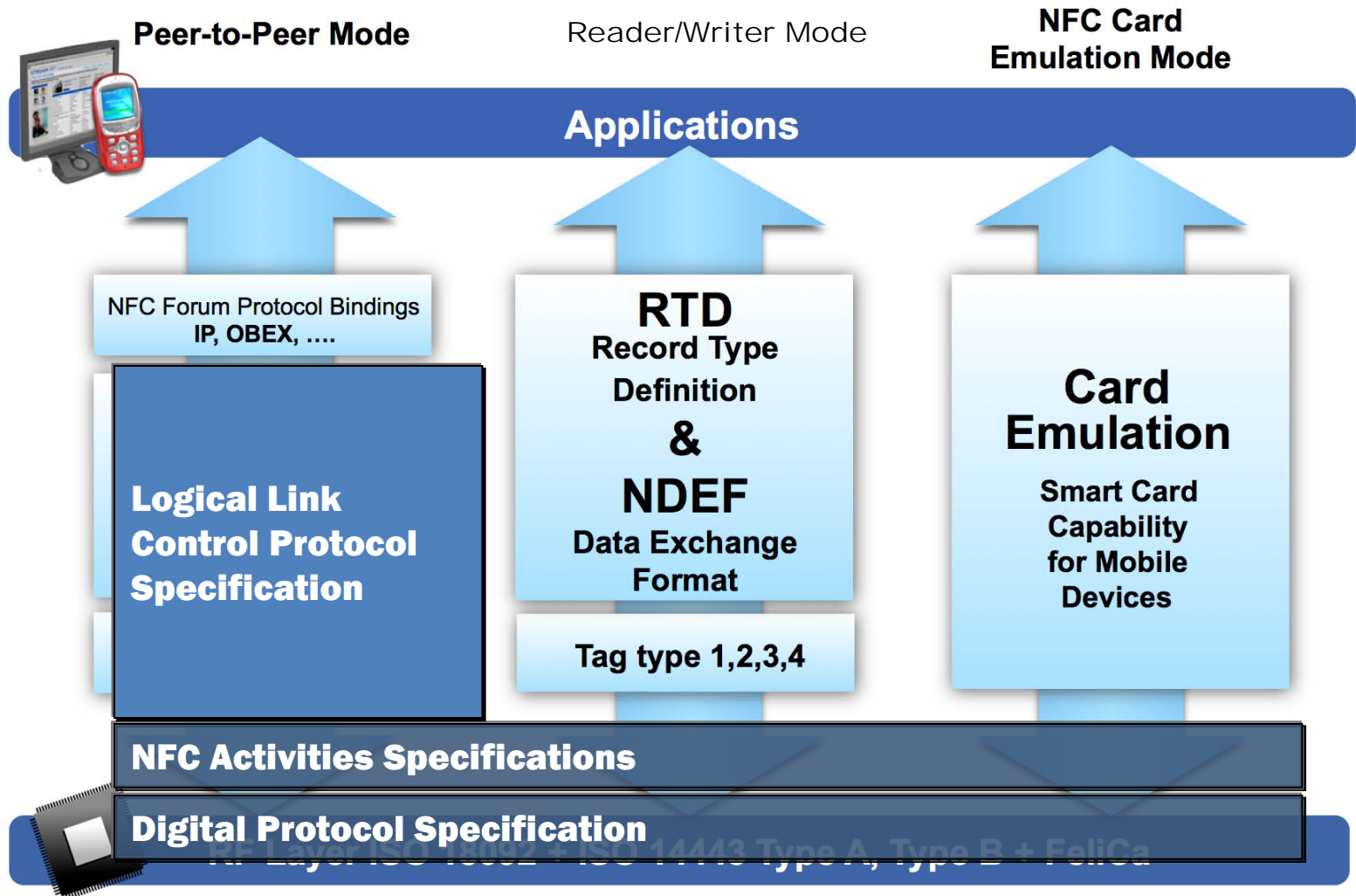
NFC Forum Technology Architecture



Logical Link Control Protocol (LLCP)

- Aim of specification:
 - Provide reliable peer-to-peer communication over NFC
- How it does this:
 - Defines a logical link control layer on top of the Digital Protocol Specification peer-mode
 - Provides support for peer-to-peer communication, connection oriented and connectionless transport, and protocol multiplexing
- Implementation issues:
 - May be implemented in NFC chip sets or in software in the device
- Where it is based in the device architecture:
 - Between RF and Application layer
 - Applicable to Peer-to-peer mode only

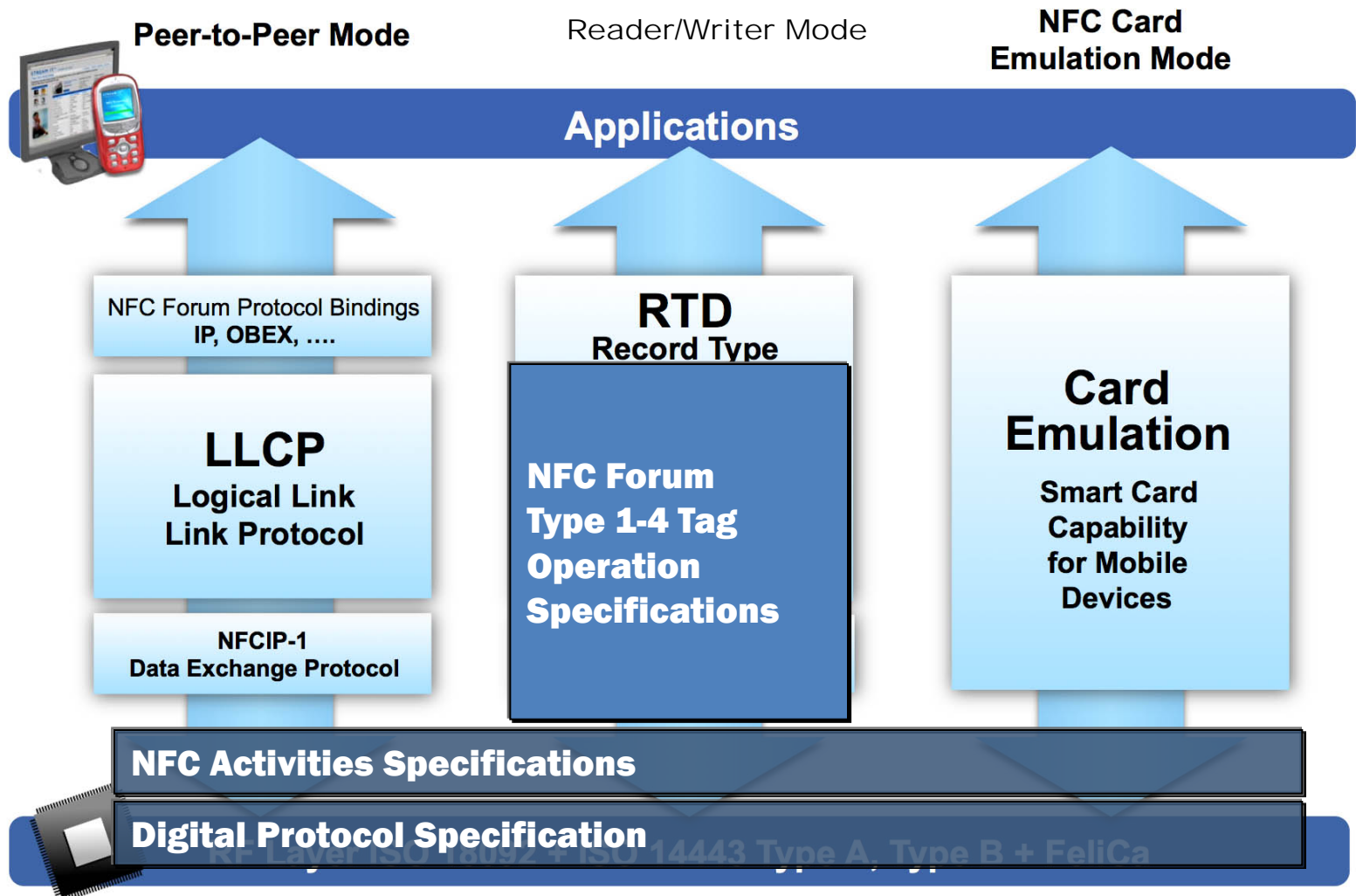
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Tag Type Specifications

- Aim of specification:
 - Defines how to read NDEF messages from NFC Forum Tags
- How it does this:
 - Defines 4 tag types
 - Defines the commands and parameters to read and write data to tags
- Implementation issues:
 - An NFC Forum device is required to be able to read and write to all tag types
- Where it is based in the device architecture:
 - Sits above RF layer and provides support to applications
 - Applicable to Reader/Writer mode only

NFC Forum Technology Architecture



Application Level Specifications

NDEF

NFC Data Exchange Format

- Aim of specification:
 - Provide a standard format for NFC application data
- How it does this:
 - Defines a message format
 - Messages consist of one or more records, which may be nested
 - A message may be split into multiple chunks
- Implementation issues:
 - NDEF messages may be up to 4GB, but are typically limited by memory considerations (such as size of tag)
- Use Cases:
 - Smart Poster
 - Exchange of control information (e.g., remote controls)

RTD

Record Type Definition

- Aim of specification:
 - Provide an extensible structure for the identification of the type of data in an NDEF message
- How it does this:
 - Defines a record structure and record type
 - Record type identifies the semantics of the data
 - Record type may be well known (defined by NFC Forum) or external (defined by another organization)
- Implementation issues:
 - External type namespace is based on domain name of organization defining the type
- Use Cases:
 - Well known RTDs include: Text, URI, Smart Poster, Generic Control, and NDEF Signature

- Aim of specification:
 - Use NFC to initiate a connection on an alternative technology
- How it does this:
 - Defines the messages for negotiating and exchanging configuration information for the alternative technology
- Implementation issues:
 - Configuration information may be defined by organizations defining the alternative technology
- Use Cases:
 - Enables quick and easy pairing with Bluetooth devices
 - Creates secure WiFi links

What's Coming Up

- Application Documents
 - Describe how to use NFC technology for a particular use case
 - “Bluetooth Secure Simple Pairing using NFC”
- Personal Healthcare Devices
 - Specifications related to communication with personal health care devices using NFC
- Enhancing NFC
 - Analogue Specification: RF properties of NFC devices
 - NFC Controller Interface Specification: Logical interface to NFC chips
 - Simple NDEF Exchange Protocol Specification: Exchange of NDEF messages over peer-to-peer

Q&A Session

Q&A Dialog Box – Enter your name and question here



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The NFC Forum

- The mission of the NFC Forum is to advance the use of NFC technology by:
 - Developing standards-based specifications that ensure interoperability among devices and services
 - Encouraging the development of products using NFC Forum specifications
 - Educating the market globally about NFC technology
 - Ensuring that products claiming NFC capabilities comply with NFC Forum specifications

We do NOT sell NFC services or products!

Why Join?

- Gain an in-depth understanding of how NFC works and its many applications
- Influence how the technical specifications are written and get an advance look at how the technology will evolve
- Have the opportunity to certify your products and display the N-Mark on devices.
- Meet other organizations that are working with NFC and jointly find new uses for the technology to create new business opportunities
- Contribute your knowledge to build the infrastructure faster and more profitably
- Highlight your company as “tech savvy” and consumer friendly
- Create a platform to be represented at global trade shows, have speaking opportunities, and participate in meetings

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Other Applicable Presentations

- NFC Forum Architecture Webcast
 - http://www.nfc-forum.org/resources/presentations/NFC_Forum_Webcast-7Oct08-NFC_For_Developers.pdf
 - <http://register.webcastgroup.com/l3/?wid=0781007084289>
- Developers Presentation from Oulu
 - http://www.nfc-forum.org/events/oulu_spotlight/2009_09_01_Secure_Element_Programming.pdf
- NFC Forum Spotlight for Developers
 - Took place Friday, 5 November 2010, in San Francisco
 - http://www.nfc-forum.org/events/san_francisco_spotlight/

For Joining Us!

