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Days
2013

Qt Connectivity in Qt 5.2

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Who are we?

- Alex Blasche
 - Qtopia, QtMobility, Qt since 2004
 - Trolltech/Nokia/Digia
 - Maintainer
 - QtPositioning
 - QtLocation
 - QtBluetooth
 - Others
- Fabian Bumberger
 - Qt since 2009
 - Nokia/BlackBerry
 - BlackBerry QtConnectivity port (NFC and Bluetooth)

Overview

- Qt Bluetooth
 - Discovery
 - Transfer
 - Future
- Qt Nfc
 - NDEF messages
 - Future
- QtMobility
- Feature sets
- HowTo & Examples
- What's next?

QtBluetooth Basic (1)



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- Since Qt 5.2
- Port and Cleanup
- API about to freeze
 - Some differences to QtMobility
- Backlog:
[QTBUG-31674](#)
- Platforms
 - Bluez 4.x/Linux
 - BlackBerry 10

QtBluetooth Basic (2)



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- Discovering capabilities
 - Local adapter
 - Device lookup
 - Service lookup
- SDP interaction
- Data Transfer
 - OBEX push
 - Peer-to-peer
- C++ & QML
- It's not a device API
- Focus on application development

Local Setup

- The Bluetooth adapter(s)

```
//Discover all local adapters
QList<QBluetoothHostInfo> list =
    QBluetoothLocalDevice::allDevices();
qWarning() << "No local adapters: " << list.count();

QBluetoothLocalDevice adapter; //local default adapter
if ( !adapter.isValid() ) {
    qWarning() << "No local adapter found";
    return;
}
adapter.setHostMode(QBluetoothLocalDevice::HostDiscoverable);
adapter.requestPairing(address, QBluetoothLocalDevice::Paired);
```

Bluetooth Awareness



- Device & service discovery

```
BluetoothDiscoveryModel {  
    id: btModel  
    running: true  
    discoveryMode: BluetoothDiscoveryModel.FullServiceDiscovery  
    onNewServiceDiscovered:  
        console.log("Found new service " + service.deviceAddress + " "  
                    + service.deviceName + " " + service.serviceName);  
}
```

Bluetooth Sockets (1)



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- Sockets
 - RFCOMM and L2CAP
 - Server and socket
 - QIODevice based
 - Service registration
 - Caveats
- API elements
 - QBluetoothSocket
 - QBluetoothServer
 - BluetoothSocket (QML)

Bluetooth Sockets (2)



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```
QBluetoothService foundService = ....
socket = new QBluetoothSocket(
    QBluetoothServiceInfo::RfcommProtocol);
socket->connectToService(foundService);

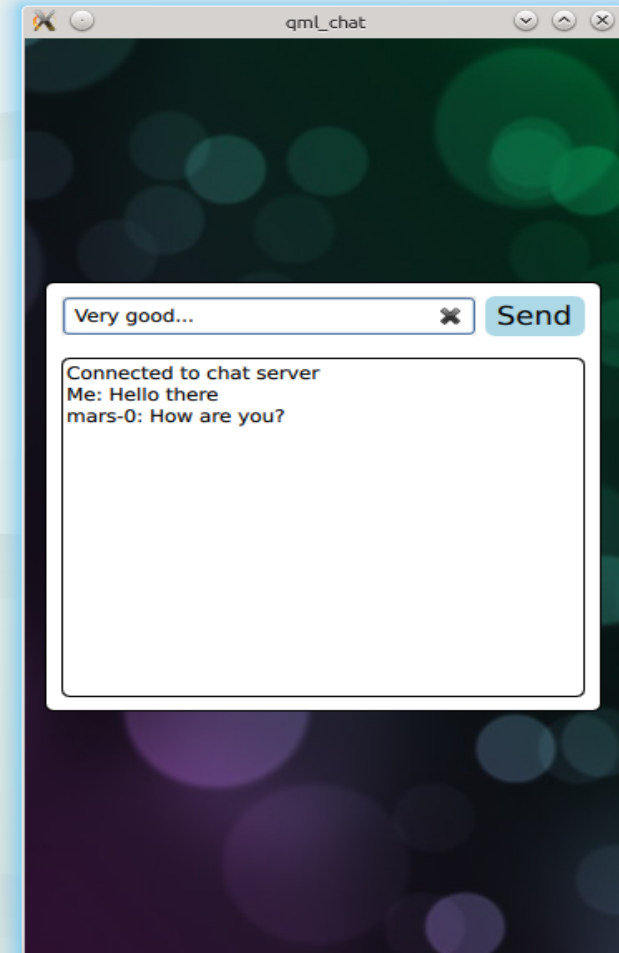
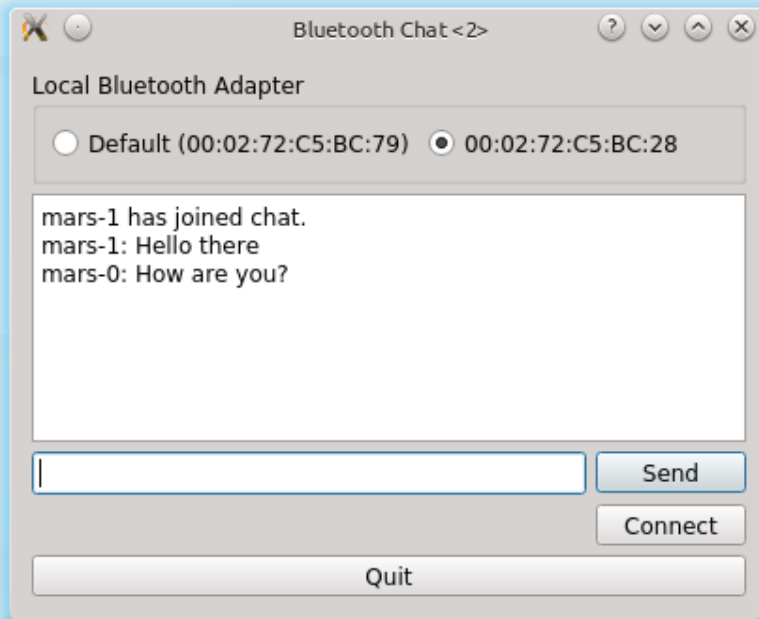
connect(socket, SIGNAL(readyRead()),
        this, SLOT(readSocket()));
connect(socket, SIGNAL(connected()),
        this, SLOT(connected()));
```

```
BluetoothSocket {
    id: socket
    connected: true
    service: serviceInfo
    onStringDataChanged: {
        console.log(socket.stringData)
        socket.stringData = "reply"
    }
}
```

```
//Setting up
QBluetoothService localService = ....
server = new QBluetoothServer(QBluetoothServiceInfo::RfcommProtocol);
connect(server, SIGNAL(newConnection()), this, SLOT(clientConnected()));
bool result = server->listen(localAdapter);
localService.registerService(localAdapter);

//Processing
QBluetoothSocket *socket = server->nextPendingConnection();
if (!socket)
    return;
connect(socket, SIGNAL(readyRead()), this, SLOT(readSocket()));
```

Screenshots



OBEX Transfer

- Object Push Profile

```
QBluetoothTransferManager mgr;  
QBluetoothTransferRequest req(m_service.device().address());  
  
m_file = new QFile("foo.bar");  
  
QBluetoothTransferReply *reply = mgr.put(req, m_file);  
  
connect(reply, SIGNAL(transferProgress(qint64,qint64)), p, SLOT(...));  
connect(reply, SIGNAL(finished(QBluetoothTransferReply*)), p, SLOT(...));  
connect(this, SIGNAL(rejected()), reply, SLOT(abort()));
```

QtBluetooth Future



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- New platforms
 - Android
 - Bluez 5.x
 - Windows
 - iOS
- Bluetooth Low Energy
- Better QML support
- Bluetooth HID
- What else?

Bluetooth Low Energy



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- Targeted for Qt 5.3
- Discover Gatt services
- Connect to LE devices
- Read/Write characteristics properties



QtNfc Basics

- Since Qt 5.2
- Port and Cleanup
- API about to freeze
 - Some differences to QtMobility
- Backlog:
QTBUG-31676
- Platforms
 - BlackBerry 10
- Target-detection
- NDEF message creation/parsing
 - URI
 - SmartPoster
 - Text

Target-interaction

- Detecting a new NFC device
 - startTargetDetection()

```
QNearFieldManager *nfManager = ...  
nfManager.startTargetDetection();
```

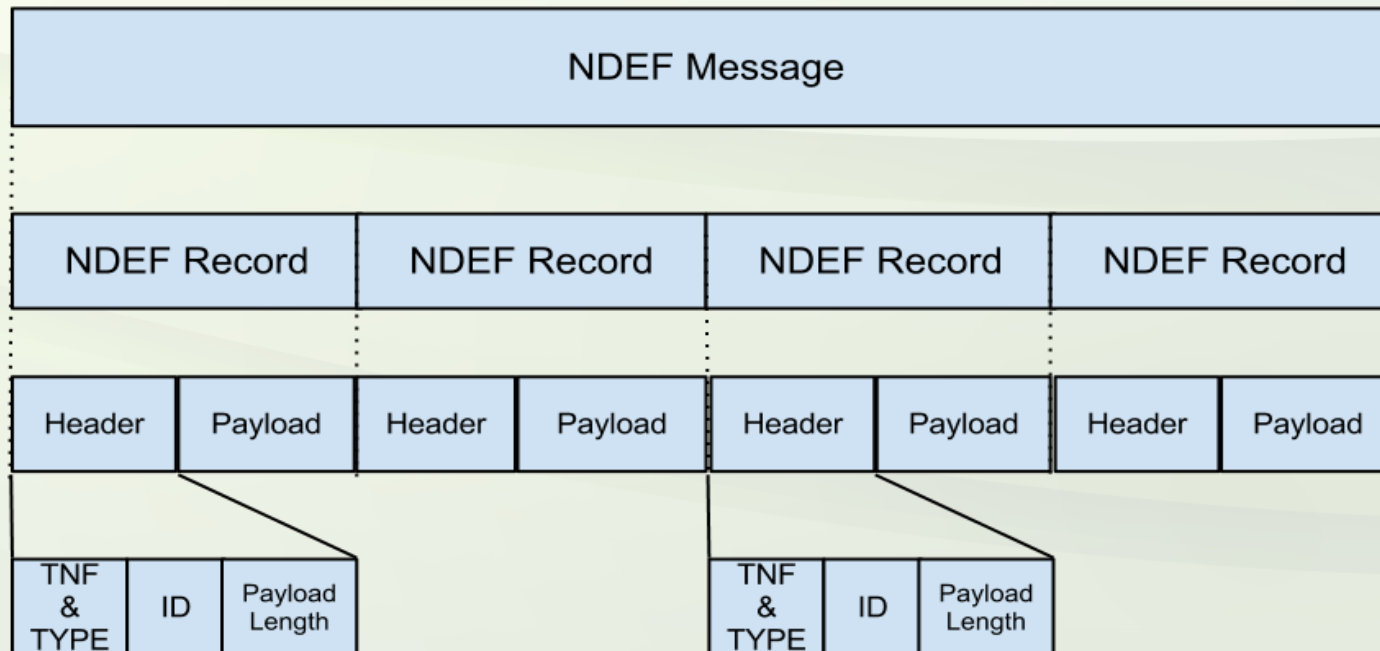
```
connect(nfManager, SIGNAL(targetDetected(QNearFieldTarget * target)),  
        this, SLOT(processTarget(QNearFieldTarget * target)));
```

- Read/Write tags

```
void processTarget(QNearFieldTarget *target) {  
    target->readNdefMessages();  
    ...  
    target->writeNdefMessages(messageList)  
}
```

NDEF Messages (1)

- NDEF Message Format
 - List of NDEF records
 - Uri/SmartPoster/Text-records



- Filtering and reading of NDEF messages

```
NearField {  
    filter: [ NdefFilter {  
        type: "U";  
        typeNameFormat: NdefRecord.NfcRtd,  
        minimum: 1;  
        maximum: 1  
    } ]  
  
    onMessageRecordsChanged: displayMessage()  
}
```

QtNfc Future

- New platforms
 - NearD/Linux
 - Android
- Share API
- QML Smart poster
- Signature RTD record
- Bluetooth pairing

NFC Share API

- Share data by touching another device
- Data transfer happens over Bluetooth, Wifi or NFC

```
QNearFieldShareManager *nfsManager = ...
nfsManager->setShareMode(FileShare);
connect(nfsManager,
        SIGNAL(targetDetected(QNearFieldShareTarget* shareTarget),
        this, SLOT(shareContent(QNearFieldShareTarget* shareTarget)));
```

```
void shareContent(QNearFieldShareTarget *shareTarget) {
    QList<QFile> files;
    ...
    shareTarget->share(files);
}
```

Questions



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Comments?