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# Interprocessor Communication Between MDM9x15/MDM9x25 and Third-Party AP

80-N5576-60 B



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# Revision History

Version	Date	Description
A	Mar 2012	Initial release
B	Aug 2012	Updated doc to be applicable to MDM9x25

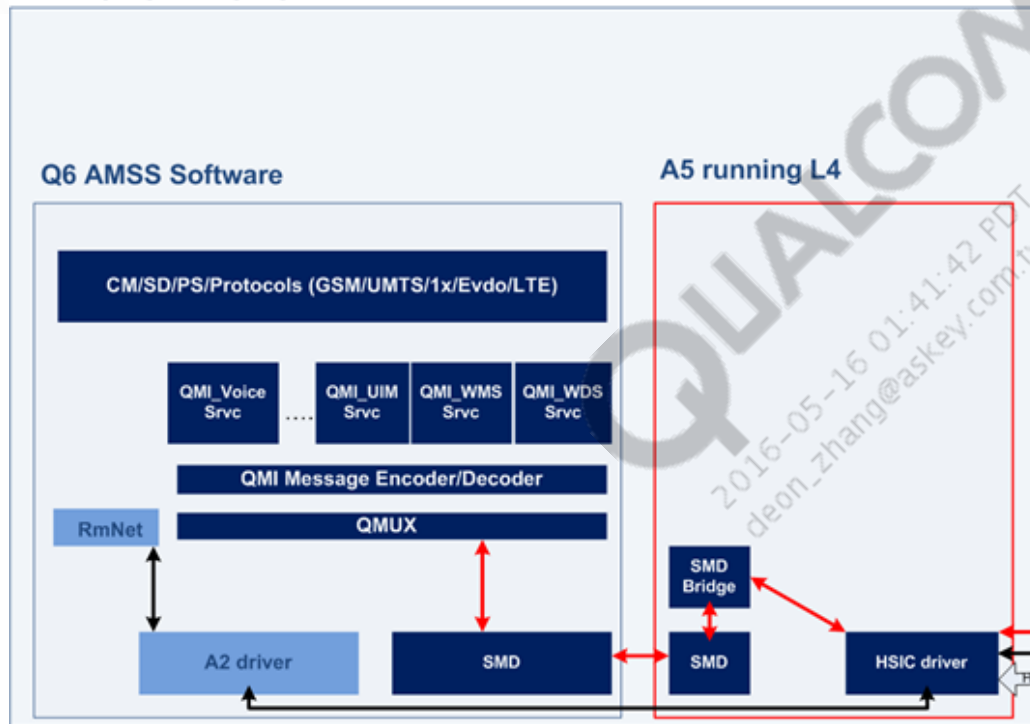
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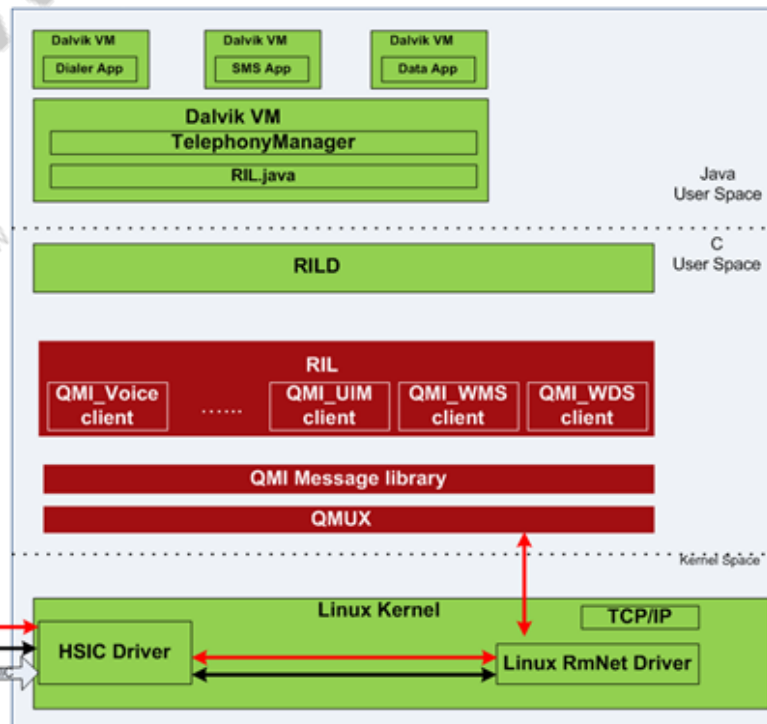
- MDM9x15/MDM9x25 + Third-Party AP
- RIL/QMI
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- RmNet Data Path
- RIL/QMI Implementation Guide
- QMI Documents
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# MDM9x15/MDM9x25 + Third-Party AP

## MDM9x15/MDM9x25



## 3rd party AP



Open Source Release(CAF or other location)

QCT SW release (.lib release)

QCT SW release (.c file release)

OEM SW

—Data Path—  
—Control Path—

# RIL/QMI

- RIL
  - RIL interface may depend on the different HLOSs, e.g., Android™, Windows Mobile, etc.; Android OS is the example in the diagram.
  - The communication between AP and Modem can be a QMI or an AT command, etc. We suggest that customers use QMI.
- QMI message library
  - The QMI message library is used to encode/decode QMI messages.
  - QCT provides a QMI message library for reference.
  - It does not cover all the QMI messages.
- Qmux
  - Qmux multiplexes QMI messages against different services, e.g., Voice, SMS, etc.



# QMI Control Path

- QMI control path
  - QMI on third-party AP ↔ HSIC driver on third-party AP ↔ HSIC driver on A5 ↔ SMD bridge on A5 ↔ SMD on Q6 ↔ QMI services on Q6
- AP side HSIC driver
  - There is open source HSIC/HS-USB driver for QCT hardware platform



# RmNet Data Path

- Data path
  - Data app on Third-Party AP ↔ HSIC driver on Third-Party AP ↔ BAM driver on A5 ↔ A2 driver on Q6 ↔ RmNet on Q6
- HSIC driver
  - There is open source HSIC/HS-USB driver for QCT hardware platform

# RIL/QMI Implementation Guide

- RIL
  - Assume that OEMs are working on Android as third-party AP
  - Two sets of RIL commands
    - Solicited commands are originated by RIL lib, such as DIAL and HANDUP
    - Unsolicited responses are originated by baseband, such as CALL\_STATE\_CHANGED and NEW\_SMS
  - QMI clients are used to communicate with QMI services, e.g., Voice, SMS, etc., on modem side
  - Initialize RmNet data path for data call
- QMI Message Library
  - QMI message format specs are available for customers
  - Encode/decode QMI message
- Qmux
  - Qmux header format specs are available for customers
  - Using Service ID to multiplex QMI messages
  - Encode/decode Qmux header

# QMI Documents

Platform-dependent	
<b>General</b>	
Qualcomm MSM™ Interface (QMI) Architecture	80-VB816-1
QMI Global Constant Definitions	80-VB816-2
QMI_CTL - QMI Control	80-VB816-3
<b>Multimode</b>	
DMS - Device Management	80-VB816-4
NAS - Network Access	80-VB816-6
WMS - Wireless Messaging (SMS)	80-VB816-9
Voice - CDMA/UMTS/Supplementary Services	80-VB816-10
<b>Data</b>	
WDS - Wireless Data	80-VB816-5
QoS - Quality of Service	80-VB816-7
<b>UIM</b>	
CAT - Card App (SIM Toolkit)	80-VB816-11
UIM - User Identity Module (SIM)	80-VB816-12
PBM - Phonebook Manager	80-VB816-15

# HSIC Host Driver Implementation Guide

- Qualcomm uses Linux open source EHCI driver for HSIC host mode
- 99% same as open source
- QCT MSM8960 change code can be found in the Commit ID shown in the table below
  - GPIO/configuration changes are required for porting to third-party AP

Commit ID	Description	Comments
39025	<ul style="list-style-type: none"><li>▪ SB: EHCI: msm</li><li>▪ Add support for HSIC-based host controller</li></ul>	<ul style="list-style-type: none"><li>▪ This patch adds support for EHCI-compliant USB host controller present in MSM™ chips.</li><li>▪ This controller uses an HSIC PHY, which communicates with downstream devices using STROBE/DATA lines.</li></ul>
e3316	<ul style="list-style-type: none"><li>▪ USB: EHCI: msm</li><li>▪ Configure GPIOs for HSIC strobe and data lines</li></ul>	Need to configure GPIO150 and GPIO151 pins for HSIC strobe and data lines.
14238	<ul style="list-style-type: none"><li>▪ Defconfig: msm8960</li><li>▪ Enable HSIC host support</li></ul>	MSM8960 – Enable HSIC host support in config file
2b592	<ul style="list-style-type: none"><li>▪ USB: EHCI</li><li>▪ Configure HSIC host↔hub↔ conventional USB devices</li></ul>	Need to configure proper hardware configurations for HSIC to work well.

# References

Ref.	Document	
Qualcomm		
Q1	<i>Application Note: Software Glossary for Customers</i>	CL93-V3077-1
Q2	<i>Qualcomm MSM® Interface (QMI) Architecture</i>	80-VB816-1
Q3	<i>QMI Global Constant Definitions</i>	80-VB816-2
Q4	<i>QMI Control Service (QMI_CTL)</i>	80-VB816-3
Q5	<i>QMI Device Management Service</i>	80-VB816-4
Q6	<i>QMI Wireless Data Service</i>	80-VB816-5
Q7	<i>QMI Network Access Service (QMI_NAS)</i>	80-VB816-6
Q8	<i>QMI QoS Service (QMI_QOS)</i>	80-VB816-7
Q9	<i>QMI Wireless Message Service (QMI_WMS)</i>	80-VB816-9
Q10	<i>QMI Voice Service (QMI_VOICE)</i>	80-VB816-10
Q11	<i>QMI Card Application Toolkit (QMI_CAT)</i>	80-VB816-11
Q12	<i>QMI User Identity Module (QMI_UIM)</i>	80-VB816-12
Q13	<i>QMI Phonebook Manager Service (QMI_PBM)</i>	80-VB816-15

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## Questions?

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