

Hands-on Workshop: SDK Bring-Up for QorlQ Communications Processors AMF-ENT-T1032

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Session 1 Getting Started

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Dession 1 - Getting Started

The Things You Will Do

- Walk through the steps to use the Freescale open-source SDK for QorIQ processors
- Prepare the board so it will reset into u-boot
- Deploy and run software scenarios for cases :
 - SMP Linux
 - DPAA Debug



Presents, the Freezenkologi, AMNo, D.S., Cole/TEST, Cadultarion, CardFine, ColdFine, Collans, Inv Energy Ethiant Solutions legs, Kineta, incolleCI, PES, PreverQUCC, Processor Esperi, Card, Carnan, EsteAssaw, Ini SateAssaw Say, SecCare, Spratnery and Vortals are tradematic of Freezenka Seriescoductor, Inc., Reg. U.S. Ppt, 877, 08 Antary, Sevit, SecSach, Carnelle, Resai, Layerange, Maryly MCP, Merchen et a Pentage, Card Carnery, 2000 CE Spram, Hard WallMUCS, Trev, Tacholm, Vyru-Tacholm, Sevit, Sevit, Sector, Security, Resai, Layerange, Maryly MCP, Merchen et a Pentage, Card Carnery, 2000 CE Spram, Hard WallMUCS, Trev, Facholm, Vyru-Tacholm, and Testisca an Stadematics of Freezenki Fernanda, Inc., 83 online product or earlies earlies are the property of their nepective interest: 0.2013 Freezenka Sandomazoro Inc.

NP Ussion 1 - Getting Started The Equipment You Will Work With

- P2041RDB QorIQ DPAA Development System
- A host Windows laptop



NP Jossion 1 - Getting Started Host Basics

- Host : Windows7
 - Teraterm /* start the terminal for serial output */
 - Tftpd32 /* provide tftp server to download images */



Presents, the Freenake logs, Mither, D.S., Code/EBT, Osdeffanic, OshFine, OshFine, OshFan, Nei Energy Ethinet, Soldione legs, Kenta, endeld T, PEG, Preve/GMCC, Processor Gaper, Zorli, Garna, Earlehaner, Inis Satelleaue legs, EstiCare, Straffanity and Vorsilla are statienade of Freecold Earconductor, the U.S. Fiz. 571, OR Antar, Berlift, BerStein, Carlwan, Rass, Layrenge, Mayri, WIC, Pattern e a Pantage, Girld Gonway, GUICC Empire, Rady My, SMMTWOS, Trive, Tribolum, Vynril and Tittica are based and an an antaria. In: XL One product or advise name are to appearing GUICC Empire. Rady My, SMMTWOS, Trive, Tribolum, Vynril and Tittica are based and the concella Service name. In the appearing the inter-interview entry. C 2011 Freedox Servicements of

NP Session 1 - Getting Started Networking

- IP addresses :
 - Host IP : 192.168.1.199 host FSL-QorIQ
 - P2041RDB IP : 192.168.1.100 target
- Host runs tftpd service to download the images to p2041rdb board



Presents, the Freenake logs, Milver, D.S., Cole/EET, Osdelfamice, OstFine, OstFine, OstFine, OstFine, Telleway, Ethiotet, Soldinere legs, Kineta, endeledit, PEG, PreveditiOC, Processor Rayer, Cortil, Garna, Estelvasae, Ine Statificase logo, EstiCare, Styripticay and Vorsilla van unalernatic of Finescale Exercicity. Hey, U.S. Par, Str., Ott. Antari, Stellit, BedStack, Carelyan, Rayer, Layersage, Mayer, MIC, Farter et Partage, Octo Distribution, Partage, Millor Distribution, Partage, Millor Distribution, Partage, Millor A, Stratter, Estivation, Carelyan, Carelona, Statificase Layer, Tatoland, Vorsili, Partage, Millor A, Stratter, Statificase et Partage, Octo Distribution, Fare, Statificase S, 2010, Farencean Statificase Control and Estimate and Estimate and Antaria.

NP Cession 1 - Getting Started Image Files

• The factory default images are located in :

C:/Program Files/tftpd32
 rcw_14g_1500mhz.bin
 u-boot-P2041RDB.bin
 fsl_fman_ucode_P2041_106_1_4.bin
 uImage-p2041rdb.bin
 fsl-image-core-p2041rdb.rootfs.ext2.gz.u-boot
 uImage-p2041rdb.dtb
 uImage-p2041rdb-usdpaa.dtb



Notational Conventions : Command prompts

```
$ <Linux host command as user>
<output>
```

```
# <target Linux command as root>
<output>
```

```
=> <target u-boot command>
<output>
```



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Documentation on Your Class PC

- SDK 1.3 CD (Yocto Source ISO): d:/yocto/documents
 click START_HERE.html
- Board information: Insert and browse USB key



NP Jossion 1 - Getting Started Install Yocto

• Mount the ISO on a linux machine:

\$ sudo mount -o loop QorIQ-SDK-V1.3-<target>-<yyyymmdd>-yocto.iso /mnt/cdrom

• As a non-root user, install the Yocto:

\$ /mnt/cdrom/install

• When you are prompted to input the install path, ensure that the current user has the correct permission for the install path.

The installation on host is:

/home/fsldwf/QorIQ-SDK-V1.3-20121114-yocto/



Presents, the Freenance tops, AlWey, D.S., Color/ESF, Cadelhanco, Galdrian, C. Allina, Ne Greegy Ethient Solutions legs, Kanta, mobile(2), PDS, Preve/QUCC, Processor Rayer, 2041), Garna, Earbanaw, Int Salekawa Kog, StacCare, Spriptery and Vordia versillenador of Freedail Enrocostuto; Inc., Rey U.S. Fig. S. Tr. Olt, Antar, Sealth, Berlin, Carella, Fina, Layerson, Mayori, MIC, Pathers et al Pathog, Gards Gonrego, Guldo Engre, Ready Rey SMURDOS, Tree, Trabolan, Vynd and Tamica and Status and Freedail Enrocostatics. Inc. 3. A construction on two reasons are to engine and processor and Pathogenesis. Control Pathogenesis. Control Pathogenesis Control Pathoge

VOUSSION 1 - Getting Started Host Environment

- Yocto requires some packages to be installed on host.
- The following steps are used for preparing the environment for Yocto running.

\$ cd <yocto_install_path>

\$./scripts/host-prepare.sh

 \$ source ./fsl-setup-poky -m <machine> -j [# of bitbake jobs] -t [# of maketasks]

For example:

\$ source ./fsl-setup-poky -m p2041rdb

/* build_p2041rdb_release/ will be generated */



NP Session 1 - Getting Started Builds

- \$ cd QorIQ-SDK-V1.3-20121114-yocto/build_p2041rdb_release
- \$ bitbake <image-target>
 - fsl-image-minimal: contains basic packages to boot up a board
 - fsl-image-core: contains common open source packages and Freescalespecific packages.
 - fsl-image-full: contains all packages in the full package list.
 - *fsl-image-flash:* contains all the user space apps needed to deploy the fsl-image-full image to a USB stick, hard drive, or other large physical media.
 - fsl-image-kvm: contains guest rootfs in qemu
 - fsl-toolchain: the cross compiler binary package
 - package-name(usdpaa): build a specific package



NP Session 1 - Getting Started Builds --continued

- Example:
 - \$ bitbake fsl-image-core







Session 2 Initial Board Bringup

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Ussion 2 - Initial Board Bringup

Verify Physical Connections Between Board And PC

- ✓ Power cable to P2041RDB
- ✓ Ethernet from board SGMII port to PC
- Serial cable from board top RS-232 port to PC, using USB-serial adapter



Presents, the Freestede logs, ANNo, D.S. Colar/EBF, CodeRear, O.MFYs, CodeFes, C.Mara, Intellingty, Ethinet Solutions legs, Kanta, mobileDF, PGS, Preve/QUCC, Processor Rayer, CortQ, Darina, Tabelauae, Intellingty, StarChen, Spripteray and VortBu and statements of Freested Enrocostum; the Leg U.S. Fig. Star. De Anter, Switz, Beekla, Beeklan, Carwin, Final, Layerspace, Hayer, March, Harrisen, and Final Color Engine. Rayer, March, Star Star, Chen, A., Star, Star, Chen, A., Star, Star, Star, Chen, A., Star, Cassion 2 - Initial Board Bringup

Verify board configuration

 Board configuration switches set to default

> SW1[1:8] = 10110100 SW2[1:8] = 00100100 SW3[1:8] = 01010111 Processor: P2041 SysClk: 83.33 Core: 1500mhz CCB: 750mhz DDR: 1333mhz Fman: 583 RCW: rcw_14g_1500mhz.bin





Presents, the Freeselde logs, Athles, D.S., Code/EEF, Cade/Harrier, OxfeFre, C.Mare, Ine Energy Ethient Solutions legs, Kineta, redshoff, PES, FreeeGUCC, Processor Garrier, Zorli, Garrian, Barkasani, Ra Sate/Assar Sag, BacCine, Straffaray and Vorlabia and traineants of Freeselak Banccoductar, too, Bey U.B. Frai, Tim. Of Antar, Berlit, BerStack, Canelar, Frais, Layersage, Mayry, MRC, Parther et a Partage, GintS Generga, GUCC Engine, Rady Fry, SM001WDS, Trave, Tubolcek, Vytnil and Tamica and Nationals of Freezon Banccoductar, function of participant on allow for annual and the property of the Anapostory and Notification of Solitory and Notification of Solitory and Anapostory and the International Anapostory and Tamica and Solitory and

board memory map

Range Start	Range End	Definition	Size
0xeff80000	Oxefffffff	u-boot (current bank)	512KB
0xeff60000	0xeff7ffff	u-boot env (current bank) 128KB	
0xef000000	0xeff5ffff	FMAN Ucode (current bank)	16MB
0xed300000	Oxeeffffff	Rootfs (alternate bank) 30MB	
0xec020000	0xed2fffff	Linux.ulmage (alternate bank)	19MB
0xec000000	0xec01ffff	Rcw (alternate bank)	128KB
0xebf80000	Oxebffffff	u-boot (alternate bank) 512KB	
0xebf60000	0xebf7ffff	u-boot env (alternate bank)	128KB
0xeb000000	0xebf5ffff	FMAN ucode (alternate bank)	16MB
0xe9300000	Oxeaffffff	Rootfs (current bank)	30MB
0xe9000000	0xe92fffff	Guest image #3 (current bank)	3MB
0xe8d00000	0xe8ffffff	Guest image #2 (current bank)	2MB
0xe8a00000	0xe8cfffff	Guest image #1 (current bank)	3MB
0xe8900000	0xe89fffff	HV config device tree (current bank) 1M	В
0xe8800000	0xe88fffff	Hardware device tree (current bank) 1M	В
0xe8700000	0xe87fffff	HV.ulmage (current bank) 1MB	
0xe8020000	0xe86fffff	Linux.ulmage (current bank)	7MB
0xe8000000	0xe801ffff	Rcw (current bank)	128K



Power On

- Log in on host.
- Start teraterm serial console
 - Select "Serial", click "OK"
 - In "Setup", click "Serial port", change the "Baudrate" to 115200
- Start Tftpd32, make sure the "Server interface" is 192.168.1.199
- Push front on/off switch on P2041RDB
 - what is the output from the console ?

=>



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Session 2 - Initial Board Bringup

```
Typical u-boot output
```

```
U-Boot 2011.12-00025-gc6d9d50 (Oct 24 2012 - 04:48:58)
  CPU0: P2041E, Version: 1.1, (0x82180111)
  Core: E500MC, Version: 2.2, (0x80230022)
  Clock Configuration:
  CPU0:1500 MHz, CPU1:1500 MHz, CPU2:1500 MHz, CPU3:1500 MHz,
  CCB:750 MHz,
  DDR:666.667 MHz (1333.333 MT/s data rate) (Asynchronous), LBC:93.750 MHz
  FMAN1: 583.333 MHz
  PME: 375 MHz
L1: D-cache 32 kB enabled
  I-cache 32 kB enabled
Board: P2041RDB, CPLD version: 4.1 vBank: 0
36-bit Addressing
Reset Configuration Word (RCW):
  00000000: 12600000 00000000 241c0000 00000000
  00000010: 648ea0c1 c3c02000 de800000 40000000
  0000020: 0000000 0000000 0000000 d0030f07
  0000030: 0000000 0000000 0000000 0000000
SERDES Reference Clocks: Bank1=100Mhz Bank2=125Mhz
[...]
```



Some u-boot Maintenance

 u-boot did not find a valid environment in flash, so used the compiled default

```
*** Warning - bad CRC, using default environment
```

- · Check the network settings and update :
 - => print => setenv ipaddr 192.168.1.100 => setenv serverip 192.168.1.199 => setenv bootargs root=/dev/ram rw console=ttyS0,115200 usdpaa_mem=256M
- · Save the updated current environment in flash :

=> saveenv



Presents, the Freenake logs, Mither, C.S., Code/EST, Osdeffanic, OstFfan, OstFfan, OstFan, Nei Ewryy Ethiemt Soldions legs, Kenta, andeledT, PEG, Preve/QUCC, Processor Gauer, Zorli, Garna, Earlehauer, Inis Satel-Aurar Egg, StatCare, Straffanier, and Vorlido and statematics of Freecold Eeroconductor, the Antar, Berlit, Berlitek, Carolin, Europeage, Mayri, WIC, Pathern e a Pantage, QurCD Charges, Rador Pay, StatCare, Dollard, Vycnil and Tattice and Estimate Statematics of Freecold Eeroconductor, for Antaria Statematics of Free Antarian Conference on the and Tattice and Estimate Antarian Conference Statematics, for Alfonso Pathern e a Pantage, QurCD Charges, Rador Jacobian, Vycnil and Tattice and Relations of Freecold Eeroconductor, for Alfonso Pathern e Antaria Statematics and the apparties of the Antarian Conference and and the apparties of the Antarian Conference and the Antarian Statematics of Free Antarian Conference and and the apparties of the Antarian Conference and the Antarian Statematics of Free Antarian Conference and the Antarian Anta

Some u-boot Maintenance

- Test network connectivity
 - => ping \$serverip



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Some u-boot Maintenance

```
    Flash rcw, u-boot, ucode to the alternative bank

  => tftp 1000000 rcw 14g 1500mhz.bin
  Using FM1@DTSEC2 device
  TFTP from server 192.168.1.199; our IP address is 192.168.1.100
  Filename 'rcw_14g_1500mhz.bin'.
  Load address: 0x1000000
  Loading: #
  done
  Bytes transferred = 248 (f8 hex)
  => erase ec000000 +100
  .done
  => cp.b 1000000 ec000000 100
  Copy to Flash... 9....done
  => tftp 1000000 u-boot-P2041RDB.bin;erase ebf80000 +80000; cp.b
   1000000 ebf80000 80000;
  => tftp 1000000 fsl_fman_ucode_P2041_106_1_4.bin; erase eb000000
   +7000; cp.b 1000000 eb000000 7000
  => cpld reset altbank (vBank1)
```



Session 2 - Initial Board Bringup

Some u-boot maintenance

· Check the images in flash

```
=> imls
Legacy Image at E8020000:
Image Name: Linux-3.0.48-rt70
Image Type: PowerPC Linux Kernel Image (gzip compressed)
Data Size: 3769254 Bytes = 3.6 MiB
Load Address: 00000000
Entry Point: 00000000
Verifying Checksum ... OK
Legacy Image at E9300000:
Image Name: fsl-image-core-p2041rdb-20121025
Image Type: PowerPC Linux RAMDisk Image (gzip compressed)
Data Size: 28838515 Bytes = 27.5 MiB
Load Address: 00000000
Entry Point: 00000000
Verifying Checksum ... OK
```



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SMP Linux Scenario

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Deploy Linux Images

- Follow the steps again to set u-boot environment and verify the network connection
 - => print
 - => setenv ipaddr 192.168.1.100
 - => setenv serverip 192.168.1.199
 - => setenv bootargs root=/dev/ram rw
 console=ttyS0,115200
- Save the updated current environment in flash :

> saveenv

- Test network connectivity
 - => ping \$serverip



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Deploy Linux Images

- - done
 - Bytes transferred = 3769318 (3983e6 hex)
 - => tftp 41000000 fsl-image-core-p2041rdb.rootfs.ext2.gz.u-boot
 - => tftp c00000 uImage-p2041rdb.dtb
 - => bootm 40000000 41000000 c00000



Deploy Linux Images

Boot SMP Linux using one of the added envvar commands :

```
=> setenv bootargs root=dev/ram rw console=ttyS0,115200
=> bootm 40000000 41000000 c00000
WARNING: adjusting available memory to 30000000
## Booting kernel from Legacy Image at 40000000 ...
 Image Name:
             Linux-3.0.48-rt70
 Image Type: PowerPC Linux Kernel Image (gzip compressed)
 Data Size: 3769254 Bytes = 3.6 MiB
 Load Address: 00000000
 Entry Point: 00000000
 Verifying Checksum ... OK
## Loading init Ramdisk from Legacy Image at 41000000 ...
  Image Name: fsl-image-core-p2041rdb-20121025
  Image Type: PowerPC Linux RAMDisk Image (gzip compressed)
  Data Size:
                28838515 Bytes = 27.5 MiB
  Load Address: 00000000
  Entry Point: 00000000
  Verifying Checksum ... OK
## Flattened Device Tree blob at 00c00000
  Booting using the fdt blob at 0x00c00000
  Uncompressing Kernel Image ... OK
  Loading Ramdisk to 2e47f000, end 2ffffa73 ... OK
  Loading Device Tree to 03fe2000, end 03fff227 ... OK
```



SMP Linux Boot

- Review the output for relevant and interesting sections
- · Log into the target system :

```
Yocto (Built by Poky 7.0) 1.2 p2041rdb ttyS0
```

```
p2041rdb login: root
root@p2041rdb:~#
```



Presents, the Freenance logs, AVWs, D.S. Code/EBT, Code/Marcin, Old/Fris, Collina, No Energy Ethiant Solutions logs, Kanta, endeddT, PSD, Preve/GMCC, Processing Raper, Qerttl, Garna, Earlevauw, An Galekauw Iog, RacCare, Spripteng and Vorlib, and tamicas and an ended and the second and the

NP Jassion 3 - SMP Linux Scenario

A Few Quick Checks

<pre># more /proc/cpu</pre>	info
processor	: 0
сри	: e500mc
clock	: 1499.985000MHz
revision	: 2.2 (pvr 8023 0022)
bogomips	: 46.87
[]	
processor	: 3
сри	: e500mc
clock	: 1499.985000MHz
revision	: 2.2 (pvr 8023 0022)
bogomips	: 46.87

total bogomips	: 187.50
timebase	: 23437500
platform	: P2041 DS
model	: fsl,P2041RDE
Memory	: 4096 MB



Pressure, the Freesede logs, AWWs, D.S. Color/EEF, Ondelfanico, On/Erie, Dollaries, D. Main, No Greeyy Ethionic Solutions app, Xinesa, model/01, PEG, Preve/DUCC, Processor Russer, Quott, Darina, Earbhauas, Int Galillaure Iog, StarCare, Symptony and Vordia are statienable of Freezed Iamcconductor, too, Rey U.S. Res. Eth. On. Antani, Staffit, Beedlack, Carefue, Fasta, Layersaga, Mayor, MRC, Pathyon et a Factage, Daring, Daring, Daring, Pathyone, D. 2005, Tareey, Tabolade, Vand and Tarristic are statements of Freezed Iamcconductor, Inc. 2007 product or annotation for apparent and more applicable and the Inconductor and the Statement Science and Statement Daring Daring. Difference Daring Tarristica and Tarristica and Statement Daring Daring. Daring Daring

A Few Quick Checks

# top ← hit '1' to show all cores											
top -	03:54:48	up 7	min,	1 u	iser,	load	aver	age: 0	.14, 0.08,	0.05	
Tasks	: 55 tota	1,	1 ru	Inning	, 54	slee	ping,	0 s	topped, @) zombie	
Cpu(s)): 0.1%us	, 0	.4%sy	, 0.	0%ni,	99.5	%id,	0.1%wa	a, 0.0%hi,	0.0%si,	0.0%st
Cpu0	: 0.0%us	, 0	.2%sy	, 0.	0%ni,	99.7	%id,	0.0%wa	a, 0.0%hi,	0.0%si,	0.0%st
Cpu1	: 0.0%us	, 0	.1%sy	, 0.	0%ni,	99.8	%id,	0.1%wa	a, 0.0%hi,	0.0%si,	0.0%st
Cpu2	: 1.8%us	, 4	.8%sy	, 0.	0%ni,	89.6	%id,	3.7%wa	a, 0.0%hi,	0.0%si,	0.0%st
Cpu3	: 0.1%us	, 0	.5%sy	, 0.	0%ni,	99.4	%id,	0.0%wa	a, 0.0%hi,	0.0%si,	0.0%st
Mem:	Mem: 4024852k total, 124364k used, 3900488k free, 920k buffers										
Swap:	Øk	tot	al,		0k u	sed,		0k fi	ree, 87	76k cached	
PID	USER	PR	NI	VIRT	RES	SHR	S %CP	U %MEM	TIME+	COMMAND	
1	root	20	0	1968	476	424	S	0.0	0:02.71	init	
2	root	20	0	0	0	0	S	0.0	0:00.00	kthreadd	
3	root	20	0	0	0	0	S	0.0	0:00.00	ksoftirqd/	0
4	root	20	0	0	0	0	S	0.0	0:00.00	kworker/0:	0
5	root	20	0	0	0	0	S	0.0	0:00.01	kworker/u:	0
6	root	RT	0	0	0	0	S	0.0	0:00.00	migration/	0
7	root	RT	0	0	0	0	S	0.0	0:00.00	migration/	1



Cassion 3 - SMP Linux Scenario

Bring Up and Test The Network

- Available interfaces : root@p2041rdb:~# ip link 1: lo: <LOOPBACK, UP, LOWER UP> mtu 16436 gdisc nogueue state UNKNOWN link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00 2: fm1-gb0: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN qlen 1000 link/ether 00:e0:0c:00:ea:00 brd ff:ff:ff:ff:ff:ff 3: fm1-gb1: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN qlen 1000 link/ether 00:e0:0c:00:ea:01 brd ff:ff:ff:ff:ff:ff 4: fm1-gb3: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN qlen 1000 link/ether 00:e0:0c:00:ea:02 brd ff:ff:ff:ff:ff:ff 5: fm1-gb3: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN qlen 1000 link/ether 00:e0:0c:00:ea:03 brd ff:ff:ff:ff:ff:ff 6: fm1-10g: <BROADCAST, MULTICAST> mtu 1500 qdisc noop state DOWN qlen 1000 link/ether 00:e0:0c:00:ea:05 brd ff:ff:ff:ff:ff:ff 7: tunl0: <NOARP> mtu 1480 qdisc noop state DOWN link/ipip 0.0.0.0 brd 0.0.0.0 8: sit0: <NOARP> mtu 1480 qdisc noop state DOWN link/sit 0.0.0.0 brd 0.0.0.0 - fm1-gb0/1 are the SGMII ports
 - fm2-gb3/4 are the RGMII ports
 - fm2-10g is the 10G port, it cannot be used.



Presents, the Freestate logs, AVWs, D.S. Code/EBT, Code/Marco, OxfEris, Collines, No Everyy Ethiant Solutions logs, Kanta, mobileDT, PEG, Preve/GMCC, Processon Rayer, Cartil, Carlona, Earbeaux, Ins. Galekaux Iog, RacCare, Spriptery and Vorlib, and tambiende of Freezek Intercoholme, the GML Reg. First. OR: Antari, Stelfit, Beddack, Carlette, European, Mayrol, MCC, Pathore is a Pathog, Cartil Convey, GUICC Ergin, Ragin Per, SMUTHOS, Tree, Tribulank, Vynit and Tamica and Erecara Rayer, Cartilic Sciences, Renords and Action Conversion and the singure in the Interchet and Sciences Sc

Bring Up and Test The Network Connection

- Assign the same IP address as for ipaddr in u-boot
 - # ifconfig fm1-gb1 192.168.1.100

```
# ping 192.168.1.199
PING 192.168.1.199 (192.168.1.199): 56 data bytes
64 bytes from 192.168.1.199: icmp_seq=0 ttl=64 time=3.203 ms
64 bytes from 192.168.1.199: icmp_seq=1 ttl=64 time=0.277 ms
--- 192.168.1.199 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.277/1.740/3.203/1.463 ms
```

```
# ping -f 192.168.1.199
PING 192.168.1.199 (192.168.1.199): 56 data bytes
--- 192.168.1.199 ping statistics ---
296 packets transmitted, 296 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.192/0.261/0.551/0.036 ms
```



Session 3 - SMP Linux Scenario

Check Interrupts

# cat	/proc/int	errupts					
	CPUØ	CPU1	CPU2	CPU3			
16:	0	0	0	0	OpenPIC	Level	<pre>mpic-error-int</pre>
24:	0	0	0	0	OpenPIC	Level	pamu
25:	0	0	0	0	OpenPIC	Level	fsl-lbc
28:	0	0	0	0	OpenPIC	Level	dma-uio0-0
29:	0	0	0	0	OpenPIC	Level	dma-uio0-1
[]					-		
36:	8617	5	141	5	OpenPIC	Level	serial
38:	0	0	41	0	OpenPIC	Level	i2c-mpc,i2c-mpc
39:	0	0	0	0	OpenPIC	Level	i2c-mpc,i2c-mpc
44:	0	1	0	0	OpenPIC	Level	ehci_hcd:usb2
45:	1	0	0	0	OpenPIC	Level	ehci_hcd:usb1
48:	0	0	0	0	OpenPIC	Level	mmc0
53:	0	0	2	0	OpenPIC	Level	fsl_espi
68:	664	0	0	0	OpenPIC	Level	fsl-sata
[]							
96:	0	0	0	0	OpenPIC	Level	fman
104:	0	0	0	0	OpenPIC	Level	qman-uio-0
105:	0	0	0	0	OpenPIC	Level	bman-uio-0
[]					-		



NP Jassion 3 - SMP Linux Scenario

Check Interrupts

	CPUØ	CPU1	CPU2	CPU3			
116:	0	0	0	33	OpenPIC	Level	QMan portal 3
117:	0	0	0	0	OpenPIC	Level	BMan portal 3
118:	0	0	33	0	OpenPIC	Level	QMan portal 2
119:	0	0	0	0	OpenPIC	Level	BMan portal 2
120:	0	32	0	0	OpenPIC	Level	QMan portal 1
121:	0	0	0	0	OpenPIC	Level	BMan portal 1
122:	89	0	0	0	OpenPIC	Level	QMan portal 0
123:	0	0	0	0	OpenPIC	Level	BMan portal 0
[]							
480:	0	0	0	0	OpenPIC	Edge	fman-err
481:	0	0	0	0	OpenPIC	Edge	bman-err
482:	0	0	0	0	OpenPIC	Edge	qman-err
484:	0	0	0	0	OpenPIC	Edge	pme-err
493:	0	0	0	0	OpenPIC	Edge	[EDAC] PC
I err							
LOC:	5596	3593	900	1310	Local tim	ner inter	rupts
SPU:	0	0	0	0	Spurious	interrup	ts
CNT:	0	0	0	0	Performar	nce monito	oring interr
upts							
MCE:	0	0	0	0	Machine o	check exce	eptions

Note all cores handling Rx IRQs servicing the same pool channel





Session 4 DPAA debug

Pressols, the Pressols logs, ABNec, C.S. Ciskel151, Dodolferin, Califfrei, Califfrei, S.Ware, the Tempp Efficient Solariani kopy, Netesia, incluines 74, No. Preve (2000). Previous Report, Davida, Garvino, SalePorton, Steam, SaleVacano, Barlon, S.Waren, Salevano, S. Californi, S. Salevano, H. Salevano, H. S. Salevano, Sal



UP Ussion 4 – DPAA debug

Do You Experience Packet Lost?

- What is FMan doing with the packets it receives?
 - Dropping the packets?
 - Enqueueing the packets to QMan?
- Starting out you want to determine whether or not the packets made it through the MAC and all the way to an FMAN port.
- Check the FMan RX port statistics.
 - There's an easy way to do this when running Linux.



Presents, the Freenade logs, Milvio, D.S., Cole/EEF, ColeManico, UMERs, Col/Fire, Cillians, Ite Energy Ethieter Bolatione logs, Keess, excelled/J. PEG, Prever/UCCC. Processor Royse, CorrU, Carina, Barbasani, Ine Satellaure logs, Raschine Strativity and Vintalia versitalimento of Freezok Renconductor, Inc., Reg. U.S. Pat. 2010. Antes, Sevith Bolack, Carvivo, Ruin, Layrengo, Mager, VIDC, Peterleve et Pentage, Carrill Carving, SUCCC Espire, Hault VIDC Espire, Hault

Cossion 4 – DPAA debug Check sysfs for Fman device statistics

 sysfs allows kernel to export statistic registers value to user process via an in-memory filesystem root@p2041rdb:~# ls /sys/devices/ffe000000.soc/ffe400000.fman/statistics

bus error cmq not empty deq 0 deg 1 deg 2 deq confirm deq from context deg from default deq from fd deq total frame enq total frame pcd enq total frame pcd kg total pcd plcr length mismatch pcd plcr recolored to red pcd_plcr_recolored_to yellow pcd plcr red pcd plcr total pcd plcr yellow pcd prs fpm command stall cycles pcd prs hard prs cycle incl stall cycles pcd prs 12 parse result returned pcd prs 12 parse result returned with err pcd prs 13 parse result returned pcd prs 13 parse result returned with err pcd prs 14 parse result returned pcd prs 14 parse result returned with err pcd prs muram read cycles pcd prs muram read stall cycles pcd prs muram write cycles pcd prs muram write stall cycles pcd prs parse dispatch pcd prs shim parse result returned pcd prs shim parse result returned with err pcd prs soft prs cycles pcd prs soft prs stall cycles read buf ecc error write buf ecc fm error write buf ecc sys error



Cassion 4 – DPAA debug Check sysfs for Fman device statistics

root@p2041rdb:~# cat /sys/devices/ffe000000.soc/ffe400000.fman/statistics/*

FM	0	counter:	F		
FM	0	counter:	F		
FM	0	counter:	760		
FM	0	counter:	0		
FM	0	counter:	0		
FM	0	counter:	760		
FM	0	counter:	0		
FM	0	counter:	760		
FM	0	counter:	1996		
FM	0	counter:	0		
FM	0	counter:	0		
FM	0	counter:	0		
FM	0	counter:	0		
[]					



Presents, the Presente logs, ADNo. D 5, Color/EST, Ondelfanic, OldPinis, OxMaria, No Energy Ethinet Solutions logs, Xinota, includeDT, PEG, PreveDUCC, Processor Raise, Scott, Garna, Earkanan, Ka Sakkanan, Ka Sakkanan, Sarra, Bartany, and Vortila and sakkanan kang Preventier, Tex-Antan, Barkit, Beddack, Carker, Pees, Layersage, Mayri, VRC, Pathore is a Pathoga, Carlo Gonvega, OxCO Enger, Rady May, SMITMOS, Tree, Tubolani, Vysnil and Tamica and Sakkanan Elementaria. In Society product or server annual and the singurup in the Angeotae server. D 2011 Prevents Scholarstation Lines

Cossion 4 – DPAA debug Check sysfs for Fman Rx port statistics

root@p2041rdb:~# ls /sys/devices/ffe000000.soc/ffe400000.fman/fff488000.port/statistics/*
/* FM1@DTSEC1 */

/sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_dealloc_buf /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_enq_total /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_bad_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_filter_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_filter_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_large_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_large_frame /sys/devices/ffe00000.soc/ffe40000.fman/ffe488000.port/statistics/port_rx_large_frame



Context Systems for Finan Rx port statistics

root@p2041rdb:~# cat /sys/devices/ffe000000.soc/ffe400000.fman/ffe488000.port/statistics/*

FM 0 Port 0 counter: 0

FM 0 Port 0 counter: 0

FM 0 Port 0 counter: 1389

FM 0 Port 0 counter: 23638

FM 0 Port 0 counter: 0



Presents, the Freenance logs, AVWe, D.S. Code/EEF, Code/Harris, D.HFris, Code/Fris, C.Haus, the Energy Ethinet Solutions legs, Kauta, mobileD, PEG, PreveOUCC, Processon Rayer, Card, Darina, Earbhauan, Ins Salekauar logs, Stachur, Symptray and Vordia versillerated or Freecab Interconductor, the U.S. Fig. E.Tr., Ott Antar, Stelfk, BedStach, Cardwar, Ress, Layersaga, Mayor, MRC, Pathers & Factaga, Darid Gonveya, DJCC Engin, Rady Rey, SMUTMOS, Trive, Todolah, Vycnil and Tamica as Indertonia of Prevention Retroconductor, for J. Onto product or server annual for the sequence and the Antaria Colling Resson, Cardwar, Stelfano, Cardwar, Teach, Stelfano, Cardwar, Teach, Stelfano, Cardwar, Teach, Stelfano, Cardwar, St

Cossion 4 – DPAA debug Check sysfs for Fman Tx port statistics

root@p2041rdb:~# ls /sys/devices/ffe000000.soc/ffe400000.fman/fff4a8000.port/statistics/*
/* FM1@DTSEC1 */

/sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_dealloc_buf /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_deq_confirm /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_deq_from_default /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_deq_total /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_discard_frame /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_enq_total /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_enq_total /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_frame /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_length_error /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/port_length_error



Cossion 4 – DPAA debug Check sysfs for Fman Tx port statistics

root@p2041rdb:~# cat /sys/devices/ffe000000.soc/ffe400000.fman/ffe4a8000.port/statistics/*

- FM 0 Port 0 counter: 0
- FM 0 Port 0 counter: 703
- FM 0 Port 0 counter: 703
- FM 0 Port 0 counter: 703
- FM 0 Port 0 counter: 0
- FM 0 Port 0 counter: 703
- FM 0 Port 0 counter: 22955
- FM 0 Port 0 counter: 0
- FM 0 Port 0 counter: 0



Presents, the Freenance logs, AVWe, D.S. Code/EEF, Code/Harris, D.WFris, Oxd/Fris, C.Wara, the Energy Ethinet Solutions logs, Konta, and Marcala, Ha Salvana, Salvana, Salvana, Ha Salvana, Ha Salvana, Salvana, Salvana, Salvana, Ha Salvana, Ha Salvana, Sa Salvana, S

Check debugfs for dpaa_eth port

```
root@p2041rdb:~# mount -t debugfs none /sys/kernel/debug
root@p2041rdb:~# ls /sys/kernel/debug
bdi caam hid
                   mmc0
                            qman
                                                     usb
                                      rcu
Bman gpio memblock powerpc qoriq-dgb sched feature wakeup sources
root@p2041rdb:~# cat /sys/kernel/debug/powerpc/fsl_dpa/eth0
DPA counters for fm1-gb0:
[...]
Device congestion stats:
[...]
DPA RX Errors:
[...]
DPA ERN counters:
```



Presents the Presente logs, AVWs, D.S., Color/EST, OsdoWarrich, OstFins, Collina, Inv Energy Ethiant Soldines logs, Xinota, endedd7, PSD, Preve/GUCC, Processor Raper, Gerld, Garna, Earlwana, Na Galdware log, SacCare, Symptony and Vorlib, and tamicaskad interacte lancacekam; to, Naj, U.S. Pp, E.Y., Ok, Antar, Barkh, Beddack, Carlwer, Rass, Layenapa, Mayri, VBC, Pathere a Patieng, Gard, Gonvega, GUCC Engin, Rady Ney, SMUTMOS, Tree, Tradicak, Vysnit and Tamica and Santaska of Presentation Researce Mayri, Inc. 20 or product or server name and the system in the Integration and Santaska Orlinova, Carlos Santaska, Carlos Santaska,

Cossion 4 – DPAA debug Check debugfs for Qman

root@p2041rdb:~# cd /sys/kernel/debugfs/qman

root@p2041rdb: /sys/kernel/debugfs/qman/fqd # echo 1 > query_fq_fields

root@p2041rdb: /sys/kernel/debugfs/qman/fqd # cat query_fq_fields

Query FQ Programmable Fields Result fqid 0x1 orprws: 0 oa: 0 olws: 0 cgid: 0 fg ctrl: None dest channel: 0 dest wq: 0 ics_cred: 0 td mant: 0 td_exp: 0 ctx b:0 ctx a: 0x0 ctx a stash exclusive: None ctx_a_stash_annotation_cl: 0 ctx_a_stash_data_cl: 0 ctx_a_stash_context_cl: 0



Presents, the Freezette logs, MMWs, D.S., Coda/EER, OxdaWarris, OxdFire, CodaFire, C.Ware, Inv Energy Ethilent Solutions logs, Xilvata, mobiled.7, PEO, PrevenDUCC. Processor Raise, Sorth, Damas, EditAssaw, Ins. Salukasaw, Ins. Stark, Salukasaw, Salukasa Salukasaw, Salukasaw, Salukasaw, Salukasaw, Salukasaw, Salukasaw, Salukasaw,

Check debugfs for Qman

root@p2041rdb:~# cd /sys/kernel/debugfs/qman/fqd

root@p2041rdb: /sys/kernel/debugfs/qman/fqd # cat summary

/* Provides a summary of all the fields in all frame queue descriptors. This is a read only file.*/

Out of Service count = 32201Retired count = 0 Tentatively Scheduled count = 566Truly Scheduled count = 0 Parked count = 0 Active, Active Held or Held Suspended count = 0 ------Prefer in cache count = 560Hold active in portal count = 0 Avoid Blocking count = 528High-priority SFDRs count = 0 CPC Stash Enable count = 0 Context-A stashing count = 528ORP Enable count = 0 Tail-Drop Enable count = 560



Presents, the Freenance logs, AVWe, D.S. Code/EEF, Code/Harris, DiefFre, Code/Free, C. Haus, Inv Energy Ethinet Solutions logs, Kanta, endeledit, PSD, Preve/DUCC, Processon Raper, Card, Darina, Earlwane, Na Salekaner logs, Rachure, Sprytherey and Vorlib, and trainistande of Freezak Benccardume, the JUS. Rep. Eth. 201 Anter, Stel/R, Beddack, Cardwar, Ress, Layersage, Mayor, MRC, Pathere is a Pathoga, CardS Converg, DUCC Engin, Rady Rey, SMITHOS, Tree, Tubolcek, Vysnit and Tamica and Indexnity. Information Retrocolation, Int. 2010 Information Retrocolation, Inter, Dollar, Vysnit



Session 5 USDPAA Scenario

Pressols, the Pressols logs, ABNec, C.S. Ciskel151, Dodolferin, Califfrei, Califfrei, S.Ware, the Tempp Efficient Solariani kopy, Netesia, incluines 74, No. Preve (2000). Previous Report, Davida, Garvino, SalePorton, Steam, SaleVacano, Barlon, S.Waren, Salevano, S. Californi, S. Salevano, H. Salevano, H. S. Salevano, Sal



Cassion 5 - USDPAA Scenario reflector : Packet Flow

- 1. Host pings a P2041 IP address
 - → sends out an ICMP_Echo request
- 2. Switch floods the frame to all P2041 ports
 - \rightarrow frame will be dropped by all but the correct one
- 3. P2041 receives the frame, swaps the IP and MAC src and dest addresses, and sends it back

 \rightarrow swap turns frame into **ICMP_Echo** to host

- 4. Host receives this frame and does ICMP_Echo_Reply
- 5. P2041 receives, swaps and sends this frame back too.
 → swap turns frame into ICMP_Echo_Reply to host
- 6. Host receives this frame and the original ping is now complete
 → the host just "pinged itself" via the P2041



Setting Up reflector

- Software images (besides FMan ucode and u-boot):
 - Device tree : ulmage-p2041rdb-usdpaa.dtb
 - Kernel and rootfs built with USDPAA support
- Uses the RGMII and SGMII ports
- Note MAC addresses of P2041 SGMII ports
 - cfr. u-boot envvars eth[x]addr



Presents: the Freerolds logit, MVNov, D.S., Code/EEST, Ocd/Harrisr, Old/Fire, Oxd/Fire, Oxd/Fire

Deploying Device Tree Image

- A different device tree blob image must be used, because some ports must be reserved for USDPAA use, and not configured as Linux network devices
- => setenv bootargs root=/dev/ram rw console=ttyS0,115200 usdpaa_mem=256M
- => tftpboot 40000000 uImage-p2041rdb.bin
- => tftpboot 41000000 fsl-image-core-p2041rdb.rootfs.ext2.gz.u-boot
 - => tftpboot c00000 uImage-p2041rdb-usdpaa.dtb
 - => bootm 40000000 41000000 c00000



Reconfigure and Boot

- The usdpaa_mem=<memory size> boot argument must be passed to the kernel, so that memory is reserved by the fsl_usdpaa driver.
- Boot using a modified command and check if the configure got applied correctly

```
[Linux boots...]
# more /proc/cmdline
root=/dev/ram rw console=ttyS0,115200 usdpaa_mem=256M
```

```
\rightarrow bootargs = OK
```

ip link | grep fm

 \rightarrow none of ports is assigned for use by Linux, all are reserved for usdpaa



Presents, the Freenance logs, AVWe, D.S. Code/EEF, Code/Marrier, DiefFre, Code/Free, C. Haus, Ino Energy Ethinet Solutions legs, Kauta, endedd7, PEG, Preve/DUCC, Processing Raper, Qurtil, Darina, Earlwanae, Nei Salekanae logo, RacCare, Spripteng and Vorlib are taskenake of Freezak Barccareburg, the U.S. Fig. E. Tr., Olt. Antari, Stelfk, Beddack, Carefuel, Feas, Layersage, Mayril, MCC, Pattere e a Pattage, Darid Goninga, DUCC Engin, Rady May, SMITHOS, Trive, Turbolank, Vysnit and Tarrisa are taskenistis of Freezak Barccareburg, Int. 20 on product or antiversities and an task pattage and Difference Colling Rady Salekanae. Coll. Pattere e a Pattage, Darid Converge, DUCC Engin, Rady May, SMITHOS, Trive, Turbolank, Vysnit and Tarrisa are taskenistis of Freezak Barccareburg, Int. 20 on product or antiversities and an task pattage and the respective averus. Coll Tarrisa, Darid Salekanabara, Salekanabara,

Testing reflector : Network Setup

• Traffic will be injected in FM1-DTSEC1. Look up its MAC address :

cd /proc/device-tree; find -name local-mac-address | sort ./soc@ffe000000/fman@400000/ethernet@e0000/local-mac-address // FM1-DTSEC1 ./soc@ffe000000/fman@400000/ethernet@e2000/local-mac-address // FM1-DTSEC2 ./soc@ffe000000/fman@400000/ethernet@e6000/local-mac-address // FM1-DTSEC3 ./soc@ffe000000/fman@400000/ethernet@e6000/local-mac-address // FM1-DTSEC4 ./soc@ffe000000/fman@400000/ethernet@e8000/local-mac-address // FM1-DTSEC5 ./soc@ffe000000/fman@400000/ethernet@e8000/local-mac-address // FM1-DTSEC5 ./soc@ffe000000/fman@400000/ethernet@e8000/local-mac-address // FM1-DTSEC5

od -t x1 ./soc\@ffe000000/fman\@400000/ethernet\@e0000/local-mac-address
0000000 00 04 9f 01 70 f7 // MAC address
0000006



Testing reflector : Network Setup

On the Linux host, create alias interface eth0:1

\$ sudo ifconfig eth0:1 192.168.10.1 netmask 255.255.25.0

Add an ARP entry for the P2041ds ingress port

\$ sudo arp -s 192.168.10.100 00:04:9f:01:70:f7



Presents, the Freenance logs, AVWe, D.S. Code/EEF, Code/Harris, D.HFris, Code/Fris, C.Haus, the Energy Ethinet Solutions legs, Kauta, mobileD, PEG, PreveOUCC, Processon Rayer, Card, Darina, Earbhauan, Ins Salekauar logs, Stachur, Symptray and Vordia versillerated or Freecab Interconductor, the U.S. Fig. E.Tr., Ott Antar, Stelfk, BedStach, Cardwar, Ress, Layersaga, Mayor, MRC, Pathers & Factaga, Darid Gonveya, DJCC Engin, Rady Rey, SMUTMOS, Trive, Todolah, Vycnil and Tamica as Indertonia of Prevention Retroconductor, for J. Onto product or server annual for the sequence and the Antaria Colling Resson, Cardwar, Stelfano, Cardwar, Teach, Stelfano, Cardwar, Teach, Stelfano, Cardwar, Teach, Stelfano, Cardwar, St

Cassion 5 - USDPAA Scenario Testing reflector : Usage root@p2041rdb:~# reflector --help Usage: reflector [OPTION...] [cpu-range]

USDPAA PPAC-based application

-b, --buffers=x:y:z -c, --fm-config=FILE -d, --dma-mem=SIZE -i, --fm-interfaces=FILE -n, --non-interactive -p, --fm-pcd=FILE cpu-range -?, --help --usage -V, --version

```
Number of buffers to allocate
FMC configuration XML file
Size of DMA region to allocate
FMAN interfaces
Ignore stdin
FMC PCD XML file
'index' or 'first'..'last'
Give this help list
Give a short usage message
Print program version
```



NP Session 5 - USDPAA Scenario Testing reflector : Startup

- Execute the /root/SOURCE_THIS script on the target
 - a PCD configuration and policy will be applied to the hardware by the fmc utility
 - the reflector application starts as a single thread on cpu 1

```
# reflector
Found /fsl,dpaa/dpa-fman0-oh@1, Tx Channel = 46, FMAN = 0, Port ID = 1
Found /fsl,dpaa/ethernet@4, Tx Channel = 40, FMAN = 0, Port ID = 0
Found /fsl,dpaa/ethernet@7, Tx Channel = 63, FMAN = 1, Port ID = 2
Found /fsl,dpaa/ethernet@8, Tx Channel = 64, FMAN = 1, Port ID = 3
Found /fsl,dpaa/ethernet@9, Tx Channel = 60, FMAN = 1, Port ID = 0
Configuring for 4 network interfaces
Allocated DMA region size 0x1000000
reflector starting
Released 0 bufs to BPID 7
Released 0 bufs to BPID 8
Released 8192 bufs to BPID 9
Thread uid:0 alive (on cpu 1)
reflector>
```



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Reflector CLI commands

reflector> help
Available commands:
offline rm macs list add help

 Threads can be listed/added/removed using the CLI, with the exception of the primary thread on CPU 1



Presents: the Freenance logis, MWex, D.S., Code/EER, CodeRamon, Old/Fire, CodeFare, C. Hara, The Energy Ethinet Solutions logis, Kenta, mobiled. PEG, PreserQUCC, Processor Royer, CodQ, Carina, EarthAssar, Int Salekasar Kog, Stachur, Shyatraya and Voralla and statematics of Freecold Exercision, Eng. U.S. Fire, Thr., Ott. Antar, Stelf, BedStack, Carolin, Faitheauer, Kog, Vieto, Pathorn in a Pachage, Quicto Engres, Rador May, Synthesis, Carolin, Stranger, Mico, Vieto, and Tamica and Ethica and Reacons Elemenotatics, Int. 30 one product or annual and to property. Their Angel Angel Scholaratory, Sch

NP Session 5 - USDPAA Scenario Testing reflector

• Start injecting ICMP traffic :

```
$ ping 192.168.10.100
PING 192.168.10.100 (192.168.10.100) 56(84) bytes of data.
64 bytes from 192.168.10.100: icmp_req=1 ttl=64 time=0.201 ms
[...]
^C
--- 192.168.10.100 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1999ms
rtt min/avg/max/mdev = 0.201/0.278/0.320/0.056 ms
```

```
$ sudo ping -f ping 192.168.10.100
PING 192.168.10.100 (192.168.10.100) 56(84) bytes of data.
```



Presents, the Freenance logs, AVWs, D.S. Code/EBT, Code/Marcin, Old/Fris, Collina, No Energy Ethiant Solutions logs, Kanta, endeddT, PSD, Preve/GMCC, Processing Raper, Qerttl, Garna, Earlevauw, An Galekauw Iog, RacCare, Spripteng and Vorlib, and tamicas and an ended and the second and the



Session 6 Initial Board Bringup with CW

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- Assume that the CW PA 10.3 is installed under a linux host, in path /opt/CodeWarrior_PA_10.3
- Start a host shell in Terminal or Terminator console
- Start the CodeWarrior:

\$ cwide &



Presents: the Freenance logs, MWex, D.S. Code/EER, Code/Eers, OxfFire, OxfFire, D.Mara, No Sweyy Ethiant Soldions legs, Kinata, readin/07, PES, Free/QUCC, Processor Rayer, Cod(), Carina, TarMasaa, Int Salekaara Kaj, StatCare, Synghray and Vintilla are stalematic of Freezak Tarccoductor, too, Rey U.S. Pot. Tr. Ot Antar, Stelf, BeeStat, CariNer, Rass, Layerage, Mayri, WIC, Pathor e a Partiage, QuCC Corpus, Bally Ny, SMX/MOS, Tree, Tubolon, Vynd and Tarrita are Statentia of Freezak Tarccoductor, for X correspondunce and you area are to graper, at the sepacture and the X Corpus Result. Conference 2011 Freezak Sectorabor Layerage. Mayri Vince 2011 Freezak Sectorabor Layerage. Resolution 2011 Freezak Sectorabor Resolution 2011 Freezak Sectorabor Resolution 2011 Freezak Sectorabor Resolution 2011 Freezak Sectorabor Resoluti

- Create a new project :
 - File→CodeWarrior→Bareboard Project Wizard
 - Project name = Bareboard
 - Processor = P2041
 - Accept Debug Target Settings and Build Settings
 - Configurations :
 - AMP (One project per core)
 - Core 0
 - Uncheck all Trace Configuration options
 - Finish



Presents, the Freezele logs, AMNo, D.S., Cob/TEST, Cadultario, CadFire, CMErre, C.Mare, InvErangy Ethiant Soldiona logs, Kineta, IndelaUT, PES, PreveGUCC, Processor Esperi, Cardi, Carnan, Estabases, Im Satel-Assar Sog, StacTare, Straftany and VictaD are tradematic of Freezele Terrecolution, for U.S. Pre- Brin. Of Antar, Seeffi, BedSack, Careful, Feas, Layrence, Mayer, VICC, Harris, Garding, Gard, Gonwaya, W.C.C. Expires, Read, My, Satel-Marcol, Andora, Steffi, BedSack, Careful, Feu, Satel, Andora, Markin, Satel-Assar, Seeffi, BedSack, Careful, Feu, Satel, Andora, Steffi, BedSack, Careful, Feu, Satel, Satel, Careful, Satel, S

- Show the C/C++ perspective from the top right tab
- Right-click the Bareboard-core0 project to open its context menu [Bareboard-core0 context]:
 - Build Project
 - ... when complete, an additional project branch is shown :

```
Binaries → Bareboard-core0.elf
```

- Since the platform is not configured, a RCW must be provided by the debugger
- Window → Show View → Remote Systems
 - Open Properties of Bareboard-core0_RAM_Download Target



Pressure, the Freesode Logs, AlWey, D.S., Cop/EST, CadeMarris, GathFee, Calline, Ne Everyy Ethient Soldiene legs, Nanta, mediad21, PDS, Preve/QUCC, Proceeding Right, Sold), Garria, Earbeaux, Int Salekaux, Int Salekaux, Int Salekaux, Sa

- Edit the Target Type:
 - Import from File System :

/opt/CodeWarrior_PA_10.3/PA_Support/\
Initialization_Files/jtag_chains/P2041RDB_RCW_1500-750-1333.txt

- Set Target Type = P2041RDB_RCW_1500-750-1333.txt
- In the Initialization Tab:
 - Check : Execute target reset (applies to...)
 - Uncheck for all cores: Core reset / Run out of reset
 - Check for e500mc-0 only : Initialize target
 - Click on : Initialize target script field
 - Select: Workspace → Bareboard-core0 → CFG → P2041RDB_init_core.tcl



Presents, the Freestate logs, AVWs, D.S., Code/EBT, Code/Marco, OxtEria, Code/Fras, C.Mara, No Everyy Ethiant Soldions logs, Xileta, incluidoll, PEG, Preve/GRCC, Proceeding Rayer, Caroli, Garina, Rahdwalan, Mic Salekaraw Jogo, RacCare, Sprintery and Vortilla and unitative and intercente Intercente Intercente Automation. Play U.S. Pp. 571, 081. Antari, Stelfa, Berdland, Carolina, Ingelanda, Marcola, Marcola, Parteria, and Partia and Antaria Soldions logi, Valueta, Intercente Automation, Play U.S. Pp. 571, 081. Antari, Stelfa, Berdland, Arthurous, Maryon, Marcola, Parteria, and Partia and Antaria Soldiona Soldia, Carolina, Tatolanda, Varia and Tatina and Antaria and Reasona Remonstrature, Int. 80 other product or annound in the antarian their stepatrate and the Distributed Soldia and Tatina and Antaria and Antaria Soldia and Antaria Antaria and Antaria Antaria. Distributed Antaria Antaria Antaria Antaria and Antaria Antaria Antaria Antaria and Antaria Antaria. Antaria Antaria

- Close the window and return to the perspective
- Hit F11 to start the debug session
 - Follow startup in an Eclipse Console view
- After applying the RCW and running the target initialization file, the debugger will halt in the main() function
- You can exercise the debugger from here :
 - Resume, Suspend, show registers and variables, look at code disassembly,
 ...
- Now the board must be prepared for booting autonomously from NOR flash :
 - requires a good RCW, u-boot and FMan ucode



- Suspend your active debug session
- Hit the Flash programmer button
 - Select Flash File To Target
 - Flash Configuration File : P2041RDB_NOR_FLASH.xml
 - File: /tftpboot/p2041rdb/rcw/RR_PX_0x09/rcw_14g_1500mhz.bin
 - Offset : 0xe8000000
 - Hit Erase and Program
 - Save to framework only
 - Repeat for :
 - /tftpboot/p2041rdb/fsl_fman_ucode_p2041_106_1_4.bin @ ef000000
 - /tftpboot/p2041rdb/u-boot-P2041RDB.bin @ eff80000



- Terminate the debug session
- Return to the teraterm window
- · Push the reset button on the board
 - u-boot comes up



Presents: the Eventskie logs, MWex, D.S., Code/EER, Code/Earl, Old/Fire, Old/Fire, Old/Fire, Differe, Differe,



