ÜberNIC Family Programming Guide

v1.01

April 22, 2024

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1. Overview/Purpose

This document contains information on using BittWare-supplied tools to program ÜberNIC FPGA boards.

2. Version/Change History

Version	Summary	Date
1.00	Initial Version	2024-03-08
1.01	Added: 1. LMS FTP Drop Site 2. Installation of BittWare SDK & Tools 3. Update BMC	2024-04-22

3. Content Conventions

This document includes the following typographic conventions.

Bold	Used to highlight a particular topic or point.
Italic	Used when drawing attention to a specific word or phrase such as a filename, command, or a directory name.
`Courier New`	Used for entry that you must type exactly as shown on your system's command line prompt. Upon typing these entries, you must press the **Enter** key on your keyboard for the command to run.
`Courier New Italics`	Used as a place holder for text you must determine and type on your own. Examples includes but not limited to filename, driver name, program name, etc.
Green Highlight	Used to draw attention to important reference
Red Highlight	Used to draw attention to important warning
< >	Used to indicate command key or key

4. Altera-Based FPGA Boards

A. Download BittWare SDK & Tools

1) LMS FTP Drop Site

Address	ftp.lms.io
Username	ubernic
Password	lmspw
Port	21 (i.e. FTP, not SFTP)
Passive	Yes

2) Download Logic

The latest BittWare sdk, tools, and bmc are located with the following sub-directory structure:

```
bittware
|    ├── bmc
|    └── sdk
```

B. Install BittWare SDK & Tools

1) Install SDK

Syntax:

```
sudo yum install <filename> <Enter>
```

Example:

```
sudo yum install bittware-sdk-2024.1.0-1.el9.rpm <Enter>
```

2) Add User to Group

Syntax:

```
sudo usermod -a -G bittware <User> <Enter>
```

Example:

```
sudo usermod -a -G bittware lms <Enter>
```

3) Install BittWare Tools

Syntax:

```
cd /usr/share/bittware-sdk/bin <Enter>
./bw_pip <Option> <Enter>
```

Example:

```
./bw_pip install <Enter>
```

4) Install Board-Specific Support

Syntax:

```
sudo yum install <filename> <Enter>
```

Example:

```
sudo yum install bittware-csp-ia440i-2024.1.0-1.el9.rpm <Enter>
```

5) Reboot

C. A-440i

1) Connect Programming Cable

Attach the provided pico-lock programming cable to the FPGA board

2) Insert Board in PCIe Slot

a) Ensure the server/workstation is powered-off

b) Insert the FPGA board into an available 8-lane or 16-lane PCIe slot

c) Plug the USB type-A end of the programming cable into an available USB plug

d) Power-on the server/workstation

3) List Available Boards

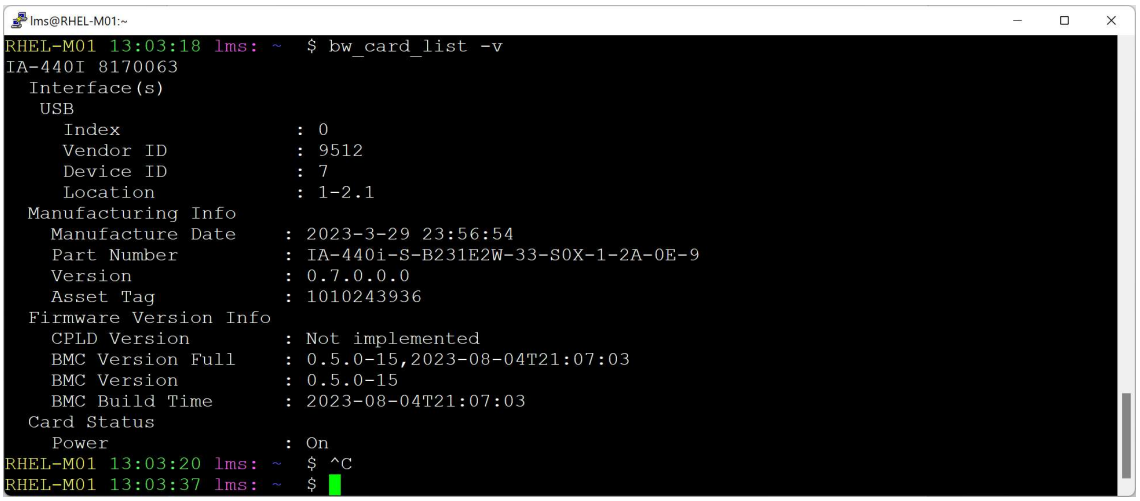
Syntax:

```
bw_card_list [Options] -v
```

Example:

```
bw_card_list -v <Enter>
```

Expected Output:



Note: The output includes the serial number immediately to the right of the model number (Ex. IA-440I 8170063, where the model number is IA-440I and the serial number is 8170063). You will use the serial number in all subsequent steps.

4) Update Board Management Controller (“BMC”)

a) Update BMC Logic

Syntax:

```
bw_bmc_upgrade -d USB:<Serial Number> program <Zip Filename> <Enter>
```

Example:

```
bw_bmc_upgrade -d USB:8170063 program bmc30-0.8.0+16.zip <Enter>
```

b) Reboot Board

Syntax:

```
bw_bmc_upgrade -d USB:<Serial Number> reboot <Enter>
```

Example:

```
bw_bmc_upgrade -d USB:8170063 reboot <Enter>
```

5) IP Logic Management

a) List Board Objects

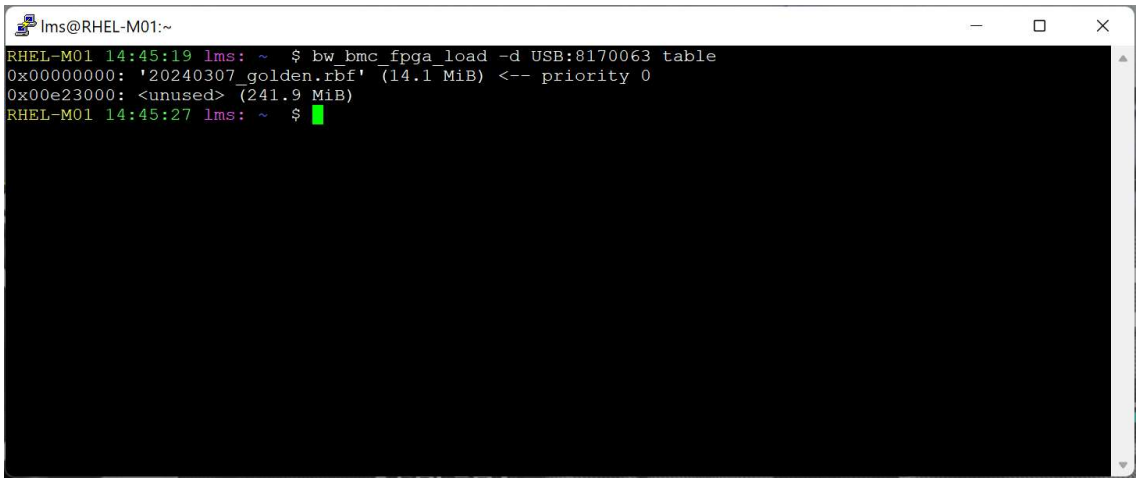
Syntax:

```
bw_bmc_fpga_load -d USB:<Serial Number> table <Enter>
```

Example:

```
bw_bmc_fpga_load -d USB:8170063 table <Enter>
```

Expected Output:



b) Delete Object

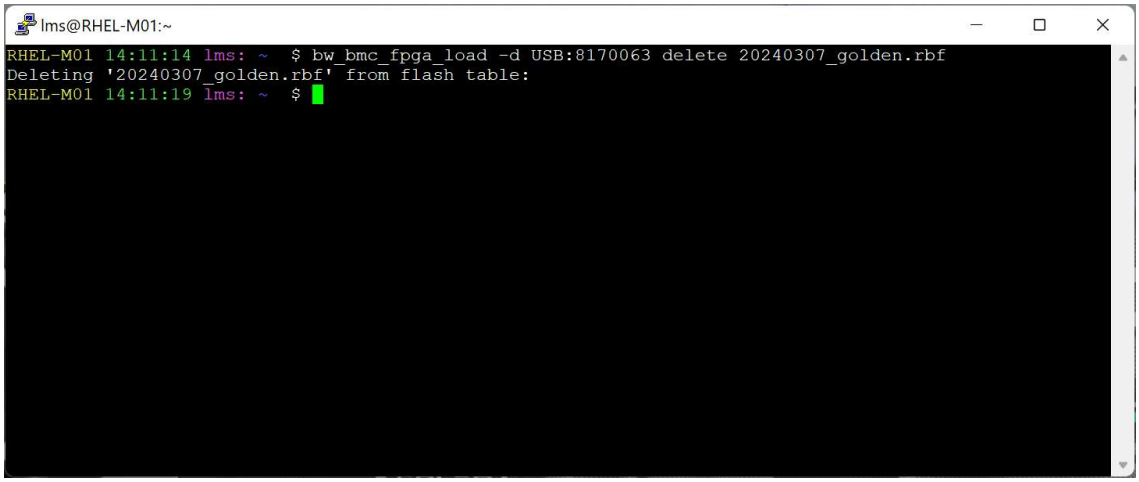
Syntax:

```
bw_bmc_fpga_load -d USB:<Serial Number> delete <Filename>
```

Example:

```
bw_bmc_fpga_load -d USB:8170063 delete 20240307_golden.rbf <Enter>
```

Expected Output:



c) Program Object

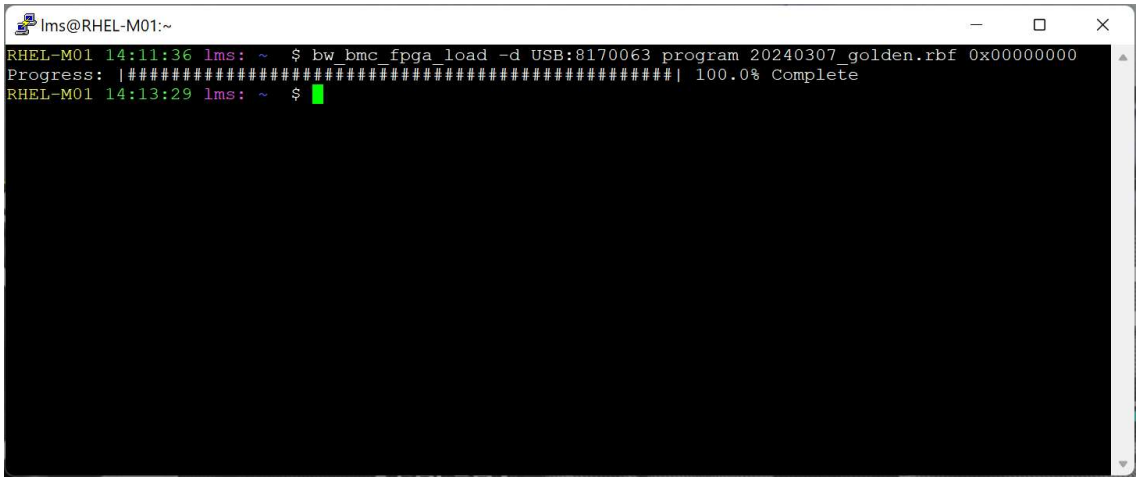
Syntax:

```
bw_bmc_fpga_load -d USB:<Serial Number> program <Filename> <Address>
```

Example:

```
bw_bmc_fpga_load -d USB:8170063 program 20240307_golden.rbf 0x00000000 <Enter>
```

Expected Output:



d) Set Object Priority

Syntax:

```
bw_bmc_fpga_load -d USB:<Serial Number> priority <numeric> <Filename>
```

Example:

```
bw_bmc_fpga_load -d USB:8170063 priority 255 20240307_golden.rbf <Enter>
```

Expected Output:

D. IA-780i

[Pending]

--- END ---