

CN_Hypervisor_Hypervisor在APROL系统上的安装和 使用测试

Exported from Confluence on 2024 January 26

We reserve the right to change the content of this document without prior notice. The information contained herein is believed to be accurate as of the date of export, however, B&R makes no warranty, expressed or implied, with regards to the information contained within this document. B&R shall not be liable in the event if incidental or consequential damages in connection with or arising from the use of this information. The software names, hardware names and trademarks used in this document are registered by the respective companies.

Table of Contents

1. 概述	.3
2. 应用架构介绍	.3
3. 工程师站APROL系统安装和 BR Hypervisor U 盘安装包制作	.5
4. 运行服务器(兼操作员站)的 APROL 系统以及 BR Hypervisor 的安装	.9
5. 项目中和控制器通讯的ANSL驱动配置以及下载参数选择	15
6. 测试中遇到的问题1	17
7. 其它	21

1. 概述

概述

Hypervisor 技术实际上是一个虚拟机管理程序,它为多个操作系统的独立运行提供了虚拟化硬件平台。 贝加莱在 Automation Studio 4.4 中已可通过 B&R Hypervisor 技术将 Windows 或 Linux 系统与贝加莱 自己的实时操作系统 Automation Runtime 并列运行。从 APROL 4.2-06 版本开始,通过 B&R Hypervisor 技术可以实现 APROL 系统与 Automation Runtime 的并列稳定运行,使工控机同时兼具实 时控制器和边缘控制器的双重功能,真正做到一机两用。本文档便以 APROL 4.2-06 版本为例,介绍了 基于 B&R Hypervisor 的 APROL 系统架构,环境系统搭建以及编程调试等方法。

下面文档的相关的内容都是以 APROL R4.2-06P10 版本上进行的测试。理解本文档的前提是已经熟悉 APROL 系统的安装、项目的创建、下载和调试等相关知识。

2. 应用架构介绍

架构介绍

2.1 软件架构 2.2 实际硬件架构 2.3 网络架构

所谓平台虚拟化就是通过某种方式隐藏底层物理硬件,从而让多个操作系统可以透明的使用和共享硬件资源的一种平台架构。B&R Hypervisor系统同样也是遵循了这一典型的分层架构。B&R Hypervisor 作为整个平台虚拟化的中间层,对上提供系统独立运行的虚拟硬件平台,对下则提供底层机器的虚拟完整访问,整个系统均运行于单台工控机之内,如下面示意图。



当 B&R Hypervisor 运行时,每个操作系统在逻辑上会与其他操作系统分离,并且不会被其他操作系统的操作损坏所影响。这样也就保证了 APROL 系统和 ARemb 系统可以独立的并列运行。同时, APROL 系统与 ARemb 系统也可通过 B&R Hypervisor 进行系统之间的内部数据交互,实现一机两 用,互有联系且互不干扰。

2.1 软件架构 2.2 实际硬件架构 2.3 网络架构

相比于传统的 APROL 系统 ORE 一体的架构(即 **工程师站,运行服务器,操作员站** 安装在一台工 控机中),基于 B&R Hypervisor 的 APROL 系统,需要将 **工程师站** 与 运行服务器(兼操作员站) 分 别装在两台不同的工控机或者计算机中,这个是由于 B&R Hypervisor 的重启机制决定的(具体请查 看 AS 帮助文档有关 B&R Hypervisor 这一章节内容)。建议 **工程师站** 可安装在笔记本上,只需负 责程序的编写。而 运行服务器和操作员站 则需要安装在集成了 B&R Hypervisor 的工控机中,负责 程序的运行以及界面的操作,如下图所示。



配置为 运行服务器和操作员站 的工控机必须专门配置添加 5AC901.IPLK-00 这个卡件!没有 5AC901.IPLK-00 这个卡件 B&R Hypervisor 无法运行的。







3. 工程师站APROL系统安装和 BR Hypervisor U 盘安装 包制作



安装时可以只勾选安装 engineering system,最后 AprolConfig 时也只是创建相应的 engineer system即可。系统创建重启后,可以打开 CaeManager 创建一个项目,接下来需要进行相应的 VMware、Windows 的授权和 AS 软件和补丁包等的安装,下一步需要去创建配置运行在 BR Hypervisor 的控制器硬件。

3.1 APROL 系统安装 3.2 配置 ARemb 硬件并创建 BR Hypervisor 的安装 U 盘

CaeManager 里面打开硬件配置,在 AS 里面配置和**运行服务器(兼操作员站)**工控机完全相同的硬 件配置,创建和配置过程中主要有下面几点需要注意(其它没有提及的请参看 AS 帮助文档有关 B&R Hypervisor 这一章节内容):

1) 工控机硬件配置添加总线模块时,需要如下图把默认的 **" shown Recommended Elements Only"** 按钮取消激活,如下图,才能出现相应的总线模块,否则显示空白,无法添加总线模块。



2) 激活B&R Hypervisor configuration 的配置为 on 后,需要点击 save 保存,避免后面网卡配置无 法选择 AR Embedded。



3)CPU属性重要参数配置如下图红圈标记位置。



4)相应的配置给 AR embedded 的网卡参数设置需要先把子网掩码和 ETHinternal 的子网掩码一 致,然后再去设置 IP 地址才行,否则会遇到下图的报错。



5)之后去创建 USB 安装盘时,需要手动如下图去设置才能在 VMware 虚拟机里面把 U 盘识别出来,选择把项目创建到这个 U 盘上去。

and more the prove the second s	E Sound Card	· · · · · · · · · · · · · · · · · · ·
L Con 2. Carry 3. Carry Capture Screen Shift+Cbri+Print Centry C	Alcor Micro Mass Storage 3 Connect (Disconnect from ho WBUS Systems CodeMeter-Stick Wake Tane Vake Peiect Configuration ID: Hyper-APC AR Version: 10.0 Configuration Version: 10.0	as 4 能出现相应的这次设备的。 Dra Devention x abid Biretet and DNS se ation ID: on ation Version:
SACSO1EXC201 SACSO1EXC201 SACSO1EXC201 SACSO1FICK00 SACSO1FICUT	He There is no additional information available at the moment. Pogma	O Neme Anome Neme N
Coldent Results Coldent Results 0 farross 0 f	1995	Close • • • • • •
🚰 Output 🏠 Debu 😡 Find L 🍇	Calif.t., 🔂 Debu., 🎕 Cont., 🗑 Break.,, 🔯 Cross., 🗊 Refer.,	COMILIER-1000 OFFLINE
P Type here to search	H = 2 *	🖬 16°C Regen 🔌 🖨 🗣 🍬 🕼 🖥 🖉 🎵 🐮 🖩 ENG 1402.0023

4. 运行服务器(兼操作员站)的 APROL 系统以及 BR Hypervisor 的安装

运行服务器(兼操作站)部分工作介绍

对于**运行服务器(兼操作员站)**的系统安装,不建议采用常规的安装步骤,而是强烈建议按照先安装 AutoYast 和 hypervisor 驱动,再安装 BR Hypervisor 安装包,最后再安装 APROL 软件的这个次序进 行。传统步骤方式安装可能最后会导致评估授权文件的破坏,导致 APROL 系统出现授权错误无法正常 使用。

4.1 系统安装前的准备工作 4.2 AutoYast 系统安装 4.3 Hypervisor 驱动安装

4.4 BR Hypervisor包安装 4.5 APROL软件安装

首先,基本的系统需求需要满足,如下图列出的内容。

System requirements

The following minimum software versions are required to operate B&R Hypervisor on the Automation PC 910 :

- ARemb upgrade AR F4.44
- Automation Studio V4.4
- Automation Studio V4.8.2 for 5PC910.SX03-00
- APC910 TS77 BIOS V1.27
- APC910 TS17 BIOS V1.14
- APC910 MTCX V1.24

其次, BR Hypervisor 安装需要满足下面两个条件:

1)启动顺序,不允许把 USB 设备设置为启动首选项。

2) 必须使用安装 GPOS 时的引导类型来引导。即如果 GPOS 安装时选择的是 UEFI 安装,那么后面安装 BR Hypervisor 也需要同样选择 UEFI 安装;反之,如果 GPOS 安装时选择的是 Legacy 安装,那么后面安装 BR Hypervisor 也需要同样选择 Legacy 安装。此处建议优先选择 UEFI 模式。

最后是 对**BIOS** 进行相应的检查,看看相关的版本、设置等是否满足条件,不满足需要相应的升级或 者参数修改,具体内容根据不同的硬件而不同,如下图:

xPC9xx-TS77 🖃

See APC 910 - B&R Hypervisor system requirements.

PPC900-TS77 - B&R Hypervisor system requirements

- Main BIOS version: ≥1.26 (menu path: Main)
- Real-time environment: Enabled (menu path: Advanced / OEM features)
- Intel Virtualization Technology: Enabled (menu path: Advanced / CPU configuration)
- Hypervisor environment: Enabled (menu path: Advanced / OEM features)
- Boot option sorting method: UEFI and Legacy (menu path: Boot / Boot configuration)

Additional information for APC910 and PPC900:

- Hardware support for virtualization technology (main BIOS version <1.30)
- Hardware support for hypervisor operation (main BIOS version ≥1.30) (recommended)
- UEFI GPOS is not supported on the target system.

xPC9xx-TS17 🖃

See APC 910 - B&R Hypervisor system requirements.

Additional information:

- Hardware support for virtualization technology (main BIOS version <1.16)
- Hardware support for hypervisor operation (main BIOS version ≥1.16) (recommended)

4.1 系统安装前的准备工作 4.2 AutoYast 系统安装 4.3 Hypervisor 驱动安装

4.4 BR Hypervisor包安装 4.5 APROL软件安装

接下来可以通过制作的 AutoYast 启动 U 盘,插到工控机上,通过启动后按下 F11 来选择这个 U 盘 启动来进行 AutoYast 系统安装的。安装时建议采用 UEFI 模式来进行安装。

其中需要注意的是,在安装分区配置时,需要预留出足够的用于安装 BR Hypervisor 的空间,一是预留空间至少 1GB,二是这个预留空间将为这个硬盘的最后一个分区且不能对这部分空间进行分区 定义,保留Free的状态。

下面以工控机常规的标称为 256G 的固态硬盘为例,实际的容量因品牌而异,下图实际该硬盘总容量 为 238.47G,先按系统默认分配,然后把最后的 /dev/sda3 去编辑修改,缩小容量。计划分配给 BR Hypervisor 的空间约为 4G 左右,则调整 /dev/sda3 为如图的 230.22G。调整结束后,总的分区只 能是三个,剩余的那 4G 不能出现在这个分区表里面的。只有这样,后面 BR Hypervisor 安装包安装 时才能正确找到这个剩余的分区来安装,否则会提示找不到相应的剩余空间来安装的错误。

Device	Size	F Enc	Туре	FS Type Label	Mount Point
/dev/sda	238.47 GiB		CSHIBA-THNSNJ25		
/dev/sda1	250.00 MiB		🌀 EFI boot	FAT	/boot/efi
/dev/sda2	4.01 GiB		🌀 Linux swap	Swap	swap
/dev/sda3	230.22 GiB		🕞 Linux native	XFS	/

下图为安装 BR Hypervisor 时提示的预留的剩余空间不正确的报错。



然后继续按通常的方式继续往下配置,执行安装即可。安装最后提示进行 APROL 软件安装的时候退 出安装,重启选择从硬盘启动系统(注意,AutoYast 安装盘还必须插在工控机上)。

 4.1 系统安装前的准备工作
 4.2 AutoYast 系统安装
 4.3 Hypervisor 驱动安装

 4.4 BR Hypervisor包安装
 4.5 APROL软件安装

重启系统后,选择从硬盘启动系统(注意,AutoYast 安装盘还必须插在工控机上),然后再登陆界 面登陆进 root 系统。 接下来打开 Yast ,然后如下图一步步操作去手动安装 Hypervisor 驱动。 先挂载 AutoYast 的 U 盘,如下两图。

6 ×							
	⁰ Software		^				
Search	Media Check	Online Update Configuration					
Software Hardware	Software Management	Software Repositories Choose the repositories for installation of software package.					
System	Hardware						
Network Services	Hardware Information	Printer					
Security and Users	Scanner	Sound					
Virtualization	~						
Support	System Keyboard Layout						
💥 Miscellaneous	System						
	K /etc/sysconfig Editor	Boot Loader					
	Date and Time	Kernel Settings					
	Language	Network Settings					
	Partitioner	Services Manager					
Ready							

Configured S	Softwar	e Repositorie	es					
						Vie	w	
						A.II	r ann an tha a	
						All	repositor	ies •
Priority 👻 E	nabled	Autorefresh	Name		Service	URL		
70	√	1	Packages			hd:///ad	ldons/apro	ol_auto
70	1	<u> </u>	Kernel-Modules			hd:///ad	Idons/anro	h kmp
99 (Default)	<u></u>	√	APROL-AutoYaST-DV	D-4.2-064		hd:///?d	levice=/de	v/sdb1
<								:
	AutoVa		004.0.000004					:
	AutoYa	ST-DVD-4.2	-064.0.220601					
APROL	- AutoYa vice=/dev	ST-DVD-4.2 v/sdb1	-064.0.220601					:
APROL· URL: hd:///?dev Category: YUM	AutoYa vice=/dev	IST-DVD-4.2 v/sdb1	-064.0.220601					:
APROL	AutoYa vice=/dev	IST-DVD-4.2 v/sdb1	-064.0.220601					;
APROL URL: hd:///?dev Category: YUM Properties	- AutoYa vice=/dev	I ST-DVD-4.2 v/sdb1	-064.0.220601					3
APROL- URL: hd:///?dev Category: YUM Properties Enabled	-AutoYa vice=/de∿ I	I ST-DVD-4.2 v/sdb1	-064.0.220601	Priority				;
APROL URL: hd:///?dev Category: YUM Properties Categold Automatically	AutoYa vice=/dev	I ST-DVD-4.2 v/sdb1	-064.0.220601 Downloaded Packages	Priority 99 🗘				;
APROL URL: hd:///?de Category: YUW roperties Enabled Automatically	AutoYa vice=/dev Refresh Edit	ST-DVD-4.2 v/sdb1	-064.0.220601 Downloaded Packages	Priority 99 ♀		GPG Keys	s Re	fresh ¥

再通过 Software Management 去搜索并安装 hypervisor 驱动,如下图,最后关闭 Yast 并重启系统。



在上面 hypervisor 驱动安装结束重启系统的时候,可以把之前已经创建好的 BR Hypervisor 的安装 U 盘插到分配给 AR embedded 的 Usb 接口上启动,按 F11 ,然后选择和 AutoYast 相同的启动模式 的启动设备。接下来在出现 BR Hypervisor 的的安装窗口选择 Install ,如下两图:

		1 Insta 2 Show	11 partitions		
l					
	۵	<u>ok</u> >	< Exit >		
Pending operat	B&R ions: system partition	Hypervisor Installa	ion - Configuration su	inmary ISNJ25	
3. Install B&F 4. Install ARe	Hypervisor b b2	TOTSOT ANA THEND ON			
5. Install Gro Execute?					

安装过程按照提示要求进行,期间会有多次重启,最后会出现安装完成结束的提示,然后点击重启完 成。



驱动参数配置和下载参数选择

对于和 AR embedded 的控制器通讯的 AnsIDriver 驱动,首先新建一个默认的 instance,接下来需要去如下图把参数项 -ipPrimary 的参数修改为 AR embedded 的 ETHinternal 里面设定的 IP 地址。



对于这个配置的 AR embedded 控制器,可以在 DownloadManager 里面如下图去选择设置,这样控制器程序才能下载的。

Project & Job	15		······································			- Controller Information	ranuarada (aufur@coneo4) .		
HW Type / H Testhy Testhy Construction Const	W Name (Instance) DL. Pos. totlers We Prepare Download Hermos Job Controller Diagnostics Manager Controller Diagnostics Manager Controller Diagnostics Manager Controller Diagnostic Properties Controller logbook report Controller logbook report Controlle	Load / / / / / / / / / / / / / / / / / / /	AD. Re. C. AI	s State	Target Information 192 166 0 228 operahy@cube02cn runtmety@cube02cn E 配置给AR IP:地址	Type: Instance: Description: Connection configuration: Data Source: Interface: P address: ANSL port: ANSL port: ANSL port (TLS): Use TLS for ANSL: TLS configuration for ANSL:	Hystrilli apcrth Hystrilli (hystrilli (hystrilli) Download State (iP address via ANSL) (122160 0228 (1109 (1179) (Download States)		ame (Insi S01 (RS0 P01 (OPC yctri01 (H
Output level: low 4/03/2023 15 4/03/2023 15	Expand branch Collapse branch Collapse branch Migh Migh Si232.40 CST CCB1 (PS81) Download ready Si23:40 CST Hyctr181 Download ready	+ s ady ady				Send Delay (ms) Timeout (AnsiDriver) (ms) Timeout (DownloadManager) (ms) ANSL Authentication Operator: Password:	2 5000 10000 10000	· · ·	
dit local pro	operties				- **	Download Warn- / Lock Levels DL warning level [%]: DL locking level [%]: 6	50 70 QK <u>C</u> ancel	aprol 15:	25:02

6. 测试中遇到的问题

问题列表和解决方法

6.1 网卡驱动问题 6.2 工程师站 Debug CFC 问题 6.3 Hypervisor 驱动升级

对于测试的 APROL R4.2-06P10, AutoYast 版本 V4.2-064.0.220601,发现其中的一个问题是当网 卡网络流量比较大时,会出现网卡不起作用的情况;当流量降低后,网卡又自动恢复。具体表现为如 无法拷贝文件,VNC 无法连接等。关于这个bug,是由于 Hypervisor 安装的 Intel-e1000e 的驱动导 致的.

目前的替代方案可以使用 zypper rm intel-e1000e 命令卸载安装的网卡驱动,而采用默认内核的 网卡驱动,然后再执行完全重启,重启完成后该问题可以解决。

B&R Hypervisor with APROL: ethernet fails continously (754415) (CSP 400383252)

Created by Johann Oeller on 2022-06-28

	4PC910 N4V	R0168421		
 GPOS: APROL R42-06P6 ETH1	Hypervisor	K0100421		
this regularly (GPOS), Dn USB->ETH adapter the connection worked. Do other IP address the connection also works. Danged everything again> download possible. Problem also occurs on the test setup. Requirement: Connected to Gigabit network "In the kernel logs continuously an Reset adapter error message is shown: Jun 23 14/48:18 bupa133 kernel: e1000e 0000:00:1f.6 eth0: Reset adapter unexpectedly" "he problem occurs quite often, if there is a high network traffic via that interface. t looks like the problem is related to our updated intel e1000e driver (3.8.7 at the moment). f the intel-e1000e driver is removed (zypper rm intel-e1000e" removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). L2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Waround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Vected devices: Device Interface APC910 ETH1 APC910 ETH2 APC3100 ETH1	 GPOS ETH1 to CTF Contro ETH2 IFOPT to API 	: APROL R4.2- eth0 192.16 RL vnet 10.0 oller IF 192.168.1 ION PLK ROL 10.0.0.1	06P6 8.10.110 .0.2 0.111	
Requirement: Connected to Gigabit network "In the kernel logs continuously an Reset adapter error message is shown: Jun 23 14:48:18 bupa133 kernel: e1000e 0000:00:1f.6 eth0: Reset adapter unexpectedly" The problem occurs quite often, if there is a high network traffic via that interface. t looks like the problem is related to our updated intel e1000e driver (3.8.7 at the moment). f the intel-e1000e driver is removed ('zypper rm intel-e1000e*'' removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). L2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Norkaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. APC910 ETH1 APC910 ETH1 APC9100 FTH1	Eth0 (e1000e On USB->ET On other IP Changed eve Problem also	e) fails regular H adapter the address the co erything again o occurs on th	y (GPOS). connection worked. unnection also works. > download possible. e test setup.	
**In the kernel logs continuously an Reset adapter error message is shown: Oun 23 14:48:18 bupa133 kernel: e1000e 0000:00:1f.6 eth0: Reset adapter unexpectedly" The problem occurs quite often, if there is a high network traffic via that interface. t looks like the problem is related to our updated intel e1000e driver (3.8.7 at the moment). f the intel-e1000e driver is removed ('zypper rm intel-e1000e*'' removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). 5.2.6-k seems to have no issues within the hypervisor. 'his workaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC910 ETH1 APC3100 FTH1	Requirement	t: Connected t	o Gigabit network	
In the failed rough can be be added to a service of the completer of the back of the completer	**in the kern	el logs contin	unusiv an Reset adapter error message is shown:	
The problem occurs quite often, if there is a high network traffic via that interface. t looks like the problem is related to our updated intel e1000e driver (3.8.7 at the moment). f the intel-e1000e driver is removed ('zypper rm intel-e1000e*" removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). t.2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Norkaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC910 ETH1 APC910 ETH1	"Jun 23 14:4	8:18 bupa133	kernel: e1000e 0000:00:1f.6 eth0: Reset adapter unexpected/v"	
t looks like the problem is related to our updated intel e1000e driver (3.8.7 at the moment). f the intel-e1000e driver is removed ('zypper rm intel-e1000e*'' removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). 3.2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Norkaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC910 ETH2 APC3100 FTH1	The problem	occurs quite	often, if there is a high network traffic via that interface.	
f the intel-e1000e driver is removed ('zypper rm intel-e1000e*" removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). 3.2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Workaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC3100 FTH1	It looks like t	the problem is	; related to our updated intel e1000e driver (3.8.7 at the moment).	
Typper rm intel-e1000e*** removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k). S.2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Norkaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC3100 FTH1	If the intel-e	1000e driver i	s removed (
B.2.6-k seems to have no issues within the hypervisor. This workaround should work for the customer for now. Norkaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC3100 FTH1	"zypper rm	intel-e1000e	*" removes the two packages), the interface uses the standard e1000e driver provided by the kernel (3.2-6-k).	
This workaround should work for the customer for now. Workaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC3100 FTH1	3.2.6-k seen	ns to have no	issues within the hypervisor.	
Workaround only takes effect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient. Affected devices: Device Interface APC910 ETH1 APC3100 FTH1	This workard	ound should w	ork for the customer for now.	
Device Interface APC910 ETH1 APC3100 ETH1	Workaround	only takes ef	ect after complete restart of the APC (hypervisor). Rebooting only Linux ist not sufficient.	
DeviceInterfaceAPC910ETH1APC3100ETH1	Affected dev	vices:		
APC910 ETH1 APC910 ETH2 APC3100 ETH1	Device	Interface		
APC910 ETH2 APC3100 ETH1	APC910	ETH1		
APC3100 FTH1	APC910	ETH2		
	APC3100	ETH1		
		1	1	

项目创建了简单逻辑的测试,发现在 runtime 系统可以正常 debug 的,如下图:

Copyright © B&R - Automatic generated PDF, Subject to change without notice CN_Hypervisor_Hypervisor在APROL系统上的安装和使用测试



但是在 engin 系统却无法正确 debug ,如下图:



最终发现,通过对 engin 系统执行最新的 R4.2-06P11 的补丁安装后,可以解决 engin 系统无法正常 debug 的问题。

6.1 网卡驱动问题 6.2 工程师站 Debug CFC 问题 6.3 Hypervisor 驱动升级

对于 Hypervisor 的驱动,默认安装的并不是最新版本的驱动。 Hypervisor 的驱动可以如下图所示在 /opt/aprol/extras4dvd/brhypervisor 目录下查看到当前系统提供的 Hypervisor 的驱动版本,建议安装 最高的驱动版本。



l	Upgrading brhypervisor: 1.5.0 -> 1.6.1.1
Hypervisor 驱动升	级后,也需要执行完全重启后才能生效。

7. 其它

其它

7.1 HDClone镜像

测试了使用 HDClone 软件去执行上面的包括 runtime 和 Hypervisor 的工控机进行镜像,可以在 一台新的相同配置的工控机上执行恢复并可以正常运行,前提条件是执行镜像的源系统采用 UEFI 模式安装! 采用 Leagcy 模式安装的源系统,HDClone 恢复后可能无法启动,需要重新安装 BR Hypervisor。

7.2 如何执行完全重启

安装了 Hypervisor 的 APROL 系统,正常情况下 AR 系统的重启和 APROL 系统的重启是完全独立的。部分情况下,如 Hypervisor 驱动升级等,需要手动去执行完全重启。方法是按下工控机的 Power button 关机后再按下 Power button 开机,即可完成 GPOS 和 AR 系统的重启。