

Hacking on Xen in the Linux Kernel

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LinuxCon North America 2013

Agenda

- Introduction
- What Got Me Interested in OPW
- Project Overview
- Xen Block Ring Protocol
- Challenges
- Current Status
- Q&A

Introduction

- Summer intern for the July – September 2013 round
- Worked on the Xen backend and frontend drivers with Konrad R* W*
- Former project manager for the XenAPI Admin Project (<http://xenapiadmin.com>) before OPW internship

My own artwork for the XenAPI Admin Project →



What Got Me Interested in OPW

- Didn't know what a Linux kernel hacker was, so I wanted to know more
- Improve my C programming skills
- Jump start my career in Linux
- Overcome my fear of hardware and operating systems

Project Overview

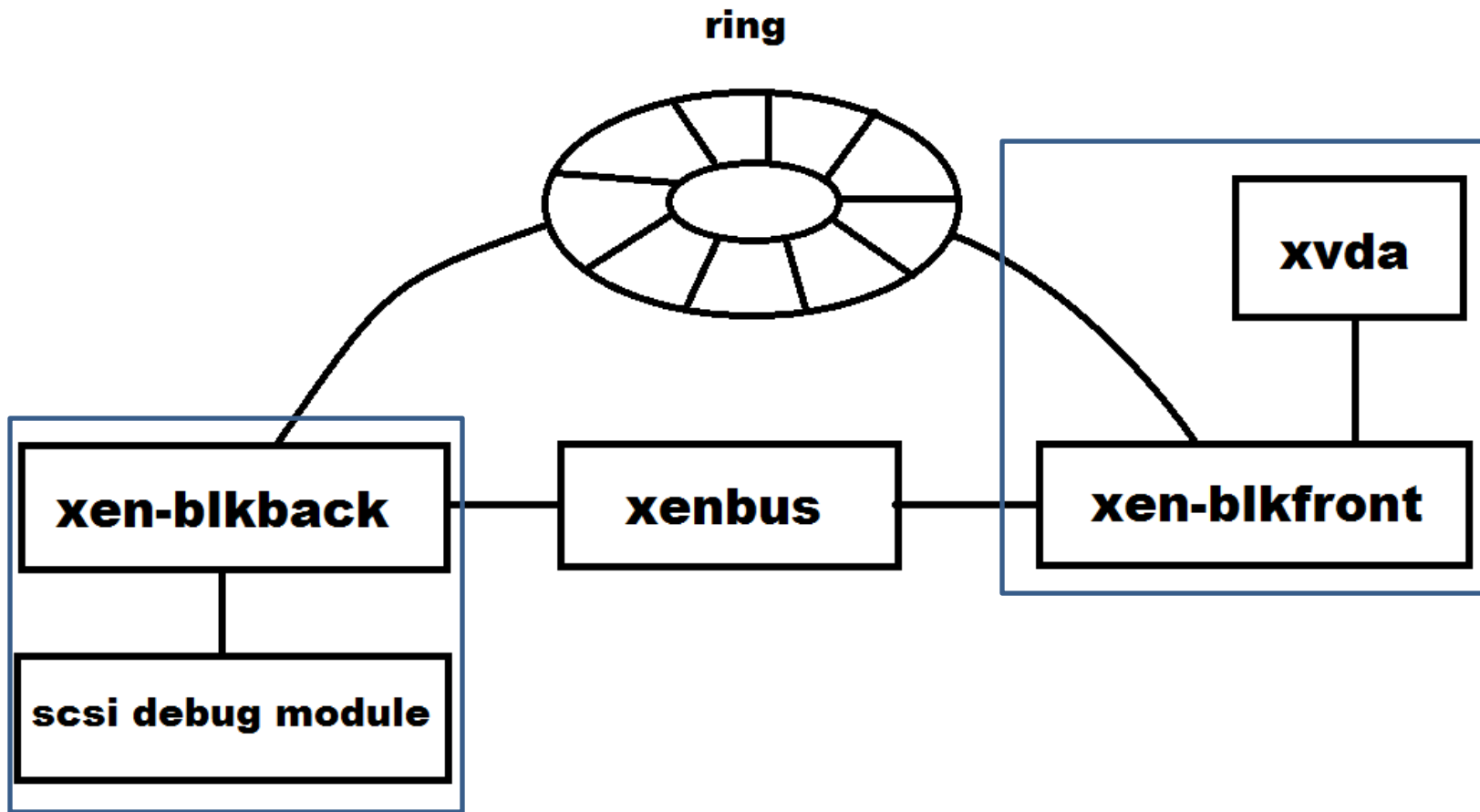
Goal:

Extend the Xen block ring protocol by implementing DIF/DIX to carry extra checksum information

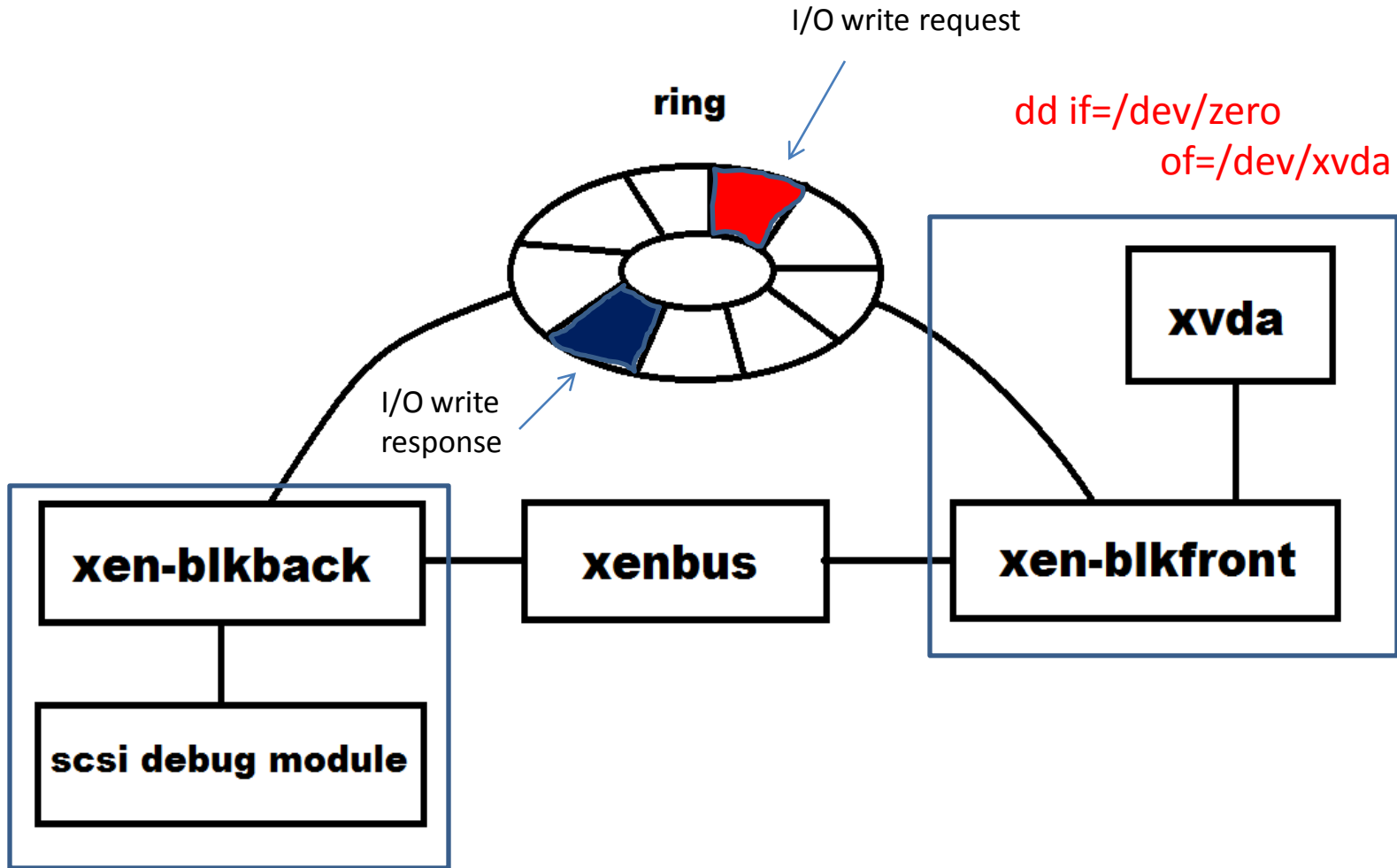
Prerequisites:

- Grok the Linux block system
- Understand how the Xen block ring protocol works
- Load SCSI debug module to test I/O
- **Lots of patience!**

Xen Block Ring Protocol



Xen Block Ring Protocol Example



Xen Block Ring Protocol with DIF Example

To enable DIF on SCSI debug module with medium error option:
`modprobe scsi_debug dif=1 opts=34`

Inside PV guest:

```
# dd if=/dev/zero of=/dev/xvda  
[ 107.298247] end_request: I/O error, dev xvda, sector 4656  
dd: writing to `/dev/xvda': Input/output error  
4657+0 records in  
4656+0 records out  
2383872 bytes (2.4 MB) copied, 76.7866 s, 31.0 kB/s
```

Inside host:

```
[ 287.158844] Sense Key : Medium Error [current]  
[ 287.207402] Info fld=0x1234  
[ 287.231665] sd 9:0:0:0: [sdg]  
[ 287.255798] Add. Sense: Unrecovered read error  
[ 287.279431] sd 9:0:0:0: [sdg] CDB:  
[ 287.302469] Read(10): 28 20 00 00 12 30 00 00 08 00  
[ 287.326488] end_request: critical target error, dev sdg, sector 4656
```

Challenges

- Juggling multiple jobs
- Changing project direction
- Getting the development process down
- **Being too serious***
- Mismanaging time:
 - Bigger picture focus

*Linux kernel mentors DO have a sense of humor. Never expected Konrad to make me laugh often in our meetings :-)

Current Status

- Will continue to hack on Xen after the OPW internship is over
- Draft documents to outline a detailed plan on how to implement DIF/DIX (currently prototyping...)
- Submit RFC patch to the xen-devel mailing list

Questions?



Credit: xenproject.org

Acknowledgement

- Konrad R*W* for being one of the best mentors I've had
- Sarah Sharp for coordinating the Linux kernel projects
- Greg K-H for offering feedback on patch submissions
- Marina Z. and Karen S. for organizing the OPW program
- Everyone else for giving their continuous support including you! :)

Resources

- DIF/DIX on LWN.net:
<http://lwn.net/Articles/280023/>
- Xen Wiki:
http://wiki.xen.org/wiki/Xen_Overview