Linux on S/390: The Beginnings of the Dream Machine

SHARE Session 9206/5549

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http://www.sinenomine.net/
• What perceived and real shortcomings existed before Linux on S/390?
• What was needed to address these shortcomings?
• Brief history of the S/390 Linux ports
• What can Linux on S/390 deliver?
• How do VM/ESA and z/VM contribute?
• Are Linux in general, and S/390 Linux in particular, ready for the enterprise?
VM is nice, but…
- Our new hires don’t know how to run it!
- It’s…. (gasp) …old!
- What’s an EBCDIC?
- Can I run Apache on that thing?
- It won’t run on my PC!
• OS/390 is nice, but…
  – Our new hires don’t know how to run it!
  – It’s…. (gasp) … old!
  – It smells of Hollerith!
  – What’s an EBCDIC?
  – Gee, it’s awfully expensive!
  – It won’t run on my PC!
• UNIX System Services are nice, but…
  – You want *how much* for the C compiler?!
  – It smells of 3270!
  – It’s just <sigh> not quite UNIX.
  – What’s an EBCDIC?
Genesis of a Dream

I’m dreaming of…
– Using all my UNIX skills on Big Iron
– Running Apache on my mainframe
– Leveraging Open Source in my business
– Getting rid of all those #$% little servers
– Gluing my mainframe apps to the intranet
– Squashing Microsoft like a bug!
The Dream Becomes Reality

- Linas Vepstas: Bigfoot
- IBM Boeblingen builds “official/unofficial” port
- Marist College distribution
- May, 2000: “It’s official!”
- LinuxWorldExpo 2001: That’s “B” as in “Billion”
Linux on S/390 Delivers…

• Not emulation – it’s the real McCoy!
• Smells of UNIX
• ASCII and byte streams
• Open Source: Free Speech, Free Beer
• Runs in LPAR, on native metal, or under VM
• S/390 architecture in the mainstream kernel
• Up-to-date kernel, utilities, and applications
...But on VM, it *REALLY* delivers

- Try it risk-free (forever)!
- Test Plan Charlie: Buy one, get 40,000 free
- You call that a LAN? Now *this* is a LAN!
- Which version, which version? Run ‘em both!
- It’s good to be the root!
- Reliable, scalable, and secure – just like VM!
- Microsoft: You can’t touch this!
Virtualizing the Virtual: It’s Turtles All the Way Down!

VM can virtualize virtual hardware, $n$ levels deep, and can run *thousands* of images at once.

- Test Plan Charlie: 41,400 Linux images in an LPAR on a G5
- Test Plan Omega: 97,943 Linux images on a ZZ7, 12-way@160 MIPS each, 16G RAM
- Thornton: Linux/390 under Hercules under Linux/390 under VM … whoda thunk it?

These specific demonstrations are “lab queens” but the practical value of this capability is very, very real!
“Why Would We Want to Do This?”

• The Bigfoot port forced the issue
• New life for big iron “dinosaurs”
• Integrating platform for S/390 legacy apps
• Rapid deployment of Open Source technology
• Because we CAN!
Linux/390: Enterprise-Ready

- CERT Advisories equivalent to commercial UNIX vendors
- NSA “Trusted Linux” initiative and Bastille Linux
- Journaling file systems:
  - IBM JFS ported to Linux
  - SGI XFS
  - Reiserfs (not quite on S/390…yet)
  - ext3
Linux/390: Enterprise-Ready

- Better performance on VM with kernel tuning
- Logical Volume Manager (LVM)
- IBM Java Technology
- DB2, Domino, MQSeries … middleware is here
- Peer review of code – especially security
- 85% of US colleges teaching Linux courses
Linux Used by...

- IBM
- Oracle (development)
- SAP (develops and deploys on Linux)
- Bynari Systems
- Peoplesoft
- Winnebago
- InfoCrossing
- Siebel
- Lawson
- Veritas
- Reuters
- Rational Software
- Computer Associates
- Telia
- Korean Air
Resources on the Web

- Marist Distribution
  www.linux390.org
- Linux/390 Project Home Page
  www.linuxvm.org
- IBM Linux zSeries Home
  www.ibm.com/servers/eserver/zseries/os/linux/
- IBM VM Linux Resources
  www.vm.ibm.com/linux/
More Resources on the Web

- Official Linux Home Page
  www.linux.org
- IBM Linux Community Development System
  www-1.ibm.com/servers/eserver/zseries/os/linux/lcds/
- “Dream Machine” Article Online
  www.linuxplanet.com/linuxplanet/reports/1532/
- Sine Nomine Associates
  www.sinenomine.net

Look in the “Useful Links” for more S/390 Linux resources.
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