Lessons Learned from an Enterprise IPv6 Deployment

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Objectives for this Presentation

- Share lessons learned from Oracle’s IPv6 deployment to date
- Add a practical angle to things you may have heard or read about when deploying IPv6, plus some new things
The Obvious Lessons You’ve Heard

• Don’t do it in a vacuum, more than a network effort
  Get early involvement from SysAdmins, applications programmers, security, desktop, management/monitoring/tools, helpdesk, etc.

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• Hardware and software readiness assessments
  * Hint – software processed platforms may not perform as well

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  Basic functionality
  Feature behavior parity
  Command Line Interface consistency

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• Take security seriously
  * Hint – mostly the same, but don’t overlook rogue RA Guard
  What about priority settings as another measure?

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  * Hint – no need to reinvent the wheel, leverage work from IPv6 World Day
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• Risk analysis

• Pilot for experience

• Training (more on this later)
The Less Obvious Lessons…

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  Competing priorities and scarce resources
  You can’t push on a string!
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  Small incremental steps, achievable milestones
  When you deployed IPv4 you weren’t running multicast for example
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• Dual stack is an admirable goal, but…
  Other mechanisms may be more practical to start
  Load balancer “tricks” may provide quickest path
  Ultimate goal versus immediate payoff
The Less Obvious Lessons…

• The business case
  More than just a larger address space
  New opportunities in design and automation
  Strategic advantage
  Enough internal benefit alone?
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  Address space conservation is no longer the primary design objective!
  You need to help bridge people over to a new way of thinking about design
  Opportunities will then be realized
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• Training
  Extremely important for this initiative!
  People may be afraid of it, although they may not admit it
  128 bit addressing can be intimidating
  Formal and very specific training for each job responsibility
  Eliminate the excuses to hide or avoid involvement
The Less Obvious Lessons…

- Spend the appropriate time on address plans
  How often in your career do you get a major “do over” like this
  Be honest with yourself, look at what has not worked, step outside the IPv4 thinking
  Might be one of the biggest opportunities of your career!
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• Secure your address space now
  It’s easier than it used to be
  Will there be a land grab?
  It is a very timely opportunity now, think very big!
  * Hint – it’s a lot easier than it used to be
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   Service providers (circuits) are still lacking support in many areas
   Formalize your requirements and give them deadlines
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• Get your best people on this, including PMs
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  Time to build consensus
  Time to secure address space, internal legal approval of contracts
  Organizational challenges, resources, and priorities
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  Keep the math simple for success!
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• Consider a candidate list of IPv6 only applications
  Where is the risk minimal?
  Machine to machine links without a user application interface
To Cheat or Not on /64 Prefixes

- It appears to be very wasteful
  Can we use /126, /127 for PTP Links?
  What do you gain? Can you still aggregate routes?
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- Is space conservation still the primary design objective?

- It is the standard*
  May break some features
  (ND/SEND, Privacy Ext, Multicast, SLAAC, etc.)
  Cheating greatly complicates the math!

* Was until 2011, see next slide
Are There Exceptions?

• Lot of Conflicting Information!

• RFC 5375 (December 2008)
  
  "/127 addresses, ...is not valid and should be strongly discouraged as documented in RFC 3627"

• RFC 6164 (April 2011)
  
  Use /127s for point-to-point router links, for security and other reasons

  Judge for yourself
  
  Your mileage may vary

*Hint - some are allocating unique /64s but configuring /127s
*Hint - not all SPs support /127s (yet?)
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- Similar Use Policy to RFC1918, but not quite
  Called “Shared Address Space”
  Cannot be publically announced
  "intended for use on SP networks“ for CGNs
  "may be used in a manner similar to RFC 1918",
  on routers that are able to translate when there are duplicate ranges
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- We still need to migrate to IPv6, but another tool is available!

See:
http://datatracker.ietf.org/doc/draft-weil-shared-transition-space-request/?include_text=1
Summary

• Seek out the new opportunities
• Help people overcome IPv4 thinking
• Secure your address space now and think big!

• Get started!