Linux and Open Source Software
Applying the Learnings of the Past to the Future

Al Gillen

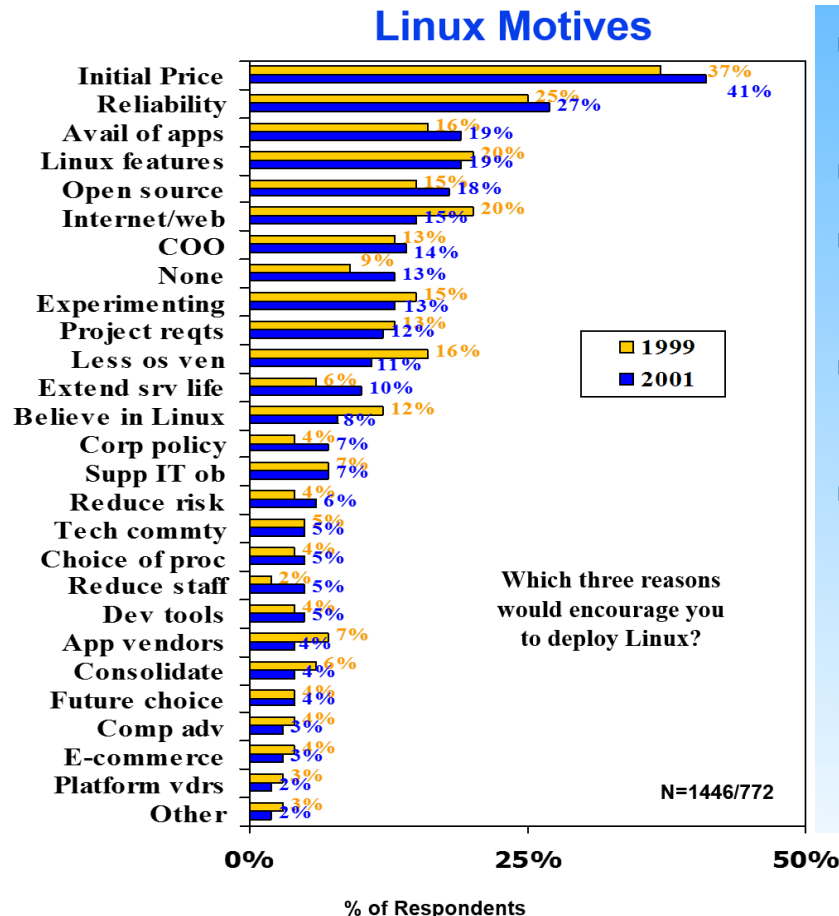**GVP, Software Development and Open Source**

February, 2017

- Looking way (way) back
- **Today's Realities & Challenges**
- **The Growing Role of Open Source Software Beyond Linux**
- **Essential Guidance**

State of the Industry in 2001

- In February 2001….
  - George W. Bush had just been sworn in as 43rd president
  - Wikipedia went online Jan 15
  - FTC approved merger of AOL and Time Warner
  - MacOS X was about to release (on March 24)
  - Windows XP would release in August
  - The .COM bust was in full swing; stock market was on the way to a low point later in the year
  - Much of the market's losses blamed on over-valued tech companies, pumped up by Internet-sized expectations
  - Meanwhile, Linux was scoring wins with its low/no cost of acquisition for budget-starved IT shops

IDC Linux Marketplace Study, 2001

Respondent motives for moving to Linux are strikingly consistent with the 1999 data – it's the economy

Linux Motives

Motive	1999	2001
Initial Price	37%	41%
Reliability	25%	27%
Avail of apps	16%	19%
Linux features	20%	19%
Open source	15%	18%
Internet/web	15%	20%
COO	13%	14%
None	9%	13%
Experimenting	15%	13%
Project reqts	12%	13%
Less os ven	16%	11%
Extend srv life	6%	10%
Believe in Linux	12%	8%
Corp policy	4%	7%
Supp IT ob	7%	7%
Reduce risk	4%	6%
Tech commty	5%	5%
Choice of proc	4%	5%
Reduce staff	2%	5%
Dev tools	4%	5%
App vendors	4%	7%
Consolidate	4%	6%
Future choice	4%	4%
Comp adv	3%	3%
E-commerce	4%	3%
Platform vdrs	2%	3%
Other	2%	3%

Which three reasons would encourage you to deploy Linux?
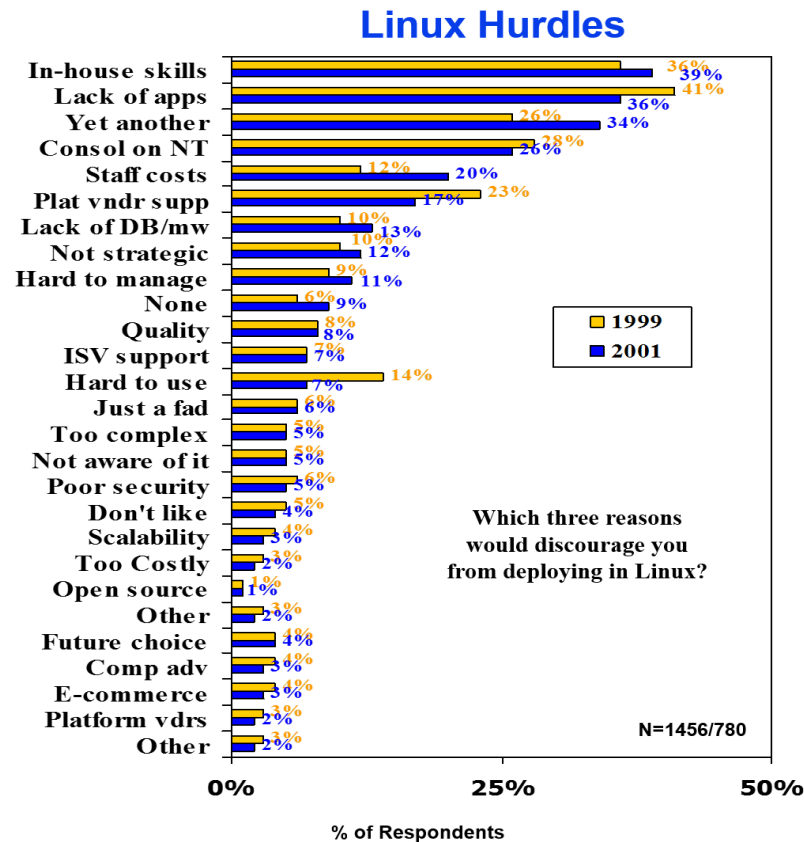
N=1446/772

% of Respondents

- Price, reliability, COO seen as advantages
- Built-in features attractive
- Open source, Internet cited as motivations
- Internet-ready diminishing value; becomes "the fabric"
- Thankfully, "believe in Linux" was fading as a driver (more mainstream adopters)

Analyze the Future

Linux Hurdles Cited

Skills set and fragmentation have increased as factors that might limit Linux deployment [11]

Linux Hurdles

Hurdle	1999	2001
In-house skills	36%	39%
Lack of apps	41%	36%
Yet another	26%	34%
Consol on NT	28%	26%
Staff costs	12%	20%
Plat vndr supp	23%	17%
Lack of DB/mw	10%	13%
Not strategic	10%	12%
Hard to manage	9%	11%
None	6%	9%
Quality	8%	8%
ISV support	8%	7%
Hard to use	14%	7%
Just a fad	6%	6%
Too complex	5%	5%
Not aware of it	5%	5%
Poor security	6%	5%
Don't like	5%	4%
Scalability	4%	3%
Too Costly	2%	2%
Open source	1%	1%
Other	3%	2%
Future choice	4%	4%
Comp adv	3%	3%
E-commerce	3%	3%
Platform vdrs	3%	2%
Other	3%	2%

Which three reasons would discourage you from deploying in Linux?

N=1456/780

% of Respondents

- Skills was the #1 or #2 challenge
- Skills challenge still rings true today
- Skill shortages today for emerging projects/prods
- We hear the same concerns related to:
  - OpenStack
  - Containers
  - DevOps
  - CNAs
  - IoT
  - And….

Source: IDC Linux Marketplace Study, 1999 and 2001
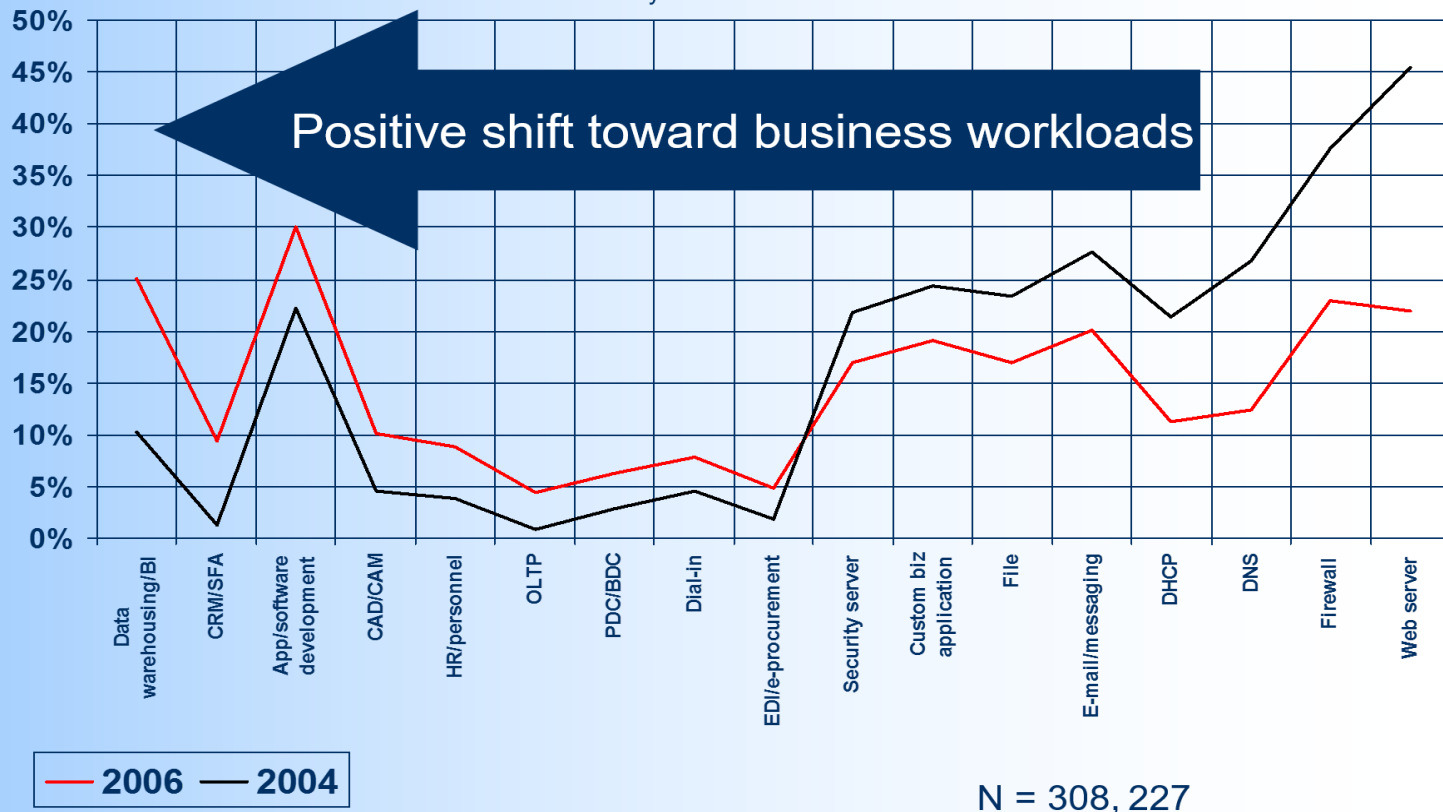
State of the Industry in 2008

- **In February 2008….**
  - iPhone had been on the market for 8 months
  - Oil had crossed $100/barrel for the first time in January
  - Stock markets around the world plunge on fears of a recession caused by the US subprime mortgage crisis
  - On Feb 5, DJIA falls 370 points, S&P drops 3.2%. On September 29, the Dow would drop 777 points
  - Fidel Castro about to announce his resignation (2/24)
  - In June, Bill Gates steps down from chairman post
  - IDC presents "*The Role of Linux as a Next Generation Business Server*" at The Linux Foundation Collaboration Summit in April, 2008

IDC
Analyze the Future

From IDC's 2008 Presentation

Server Deployment User or Intentions
Sorted on 2004-2006 shifts (3% or > change)

E6. For which of these server workloads do you use or intend to use Linux?

Positive shift toward business workloads

N = 308, 227

Legend: 2006 (red), 2004 (black)

Categories: Data warehousing/BI, CRM/SFA, App/software development, CAD/CAM, HR/personnel, OLTP, PDC/BDC, Dial-In, EDI/e-procurement, Security server, Custom biz application, File, E-mail/messaging, DHCP, DNS, Firewall, Web server

© 2008 IDC   Source: Linux Marketplace Study, 2007 and 2005   Jan-17

Source: IDC Linux Marketplace Study, 2005, 2007

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Top-Down Credibility
Setting the Stage for Future Open Source Software

- **Grass roots not growing: Linux gains credibility with top management**
- **Mission-critical workloads and acquisition of enterprise servers growing**
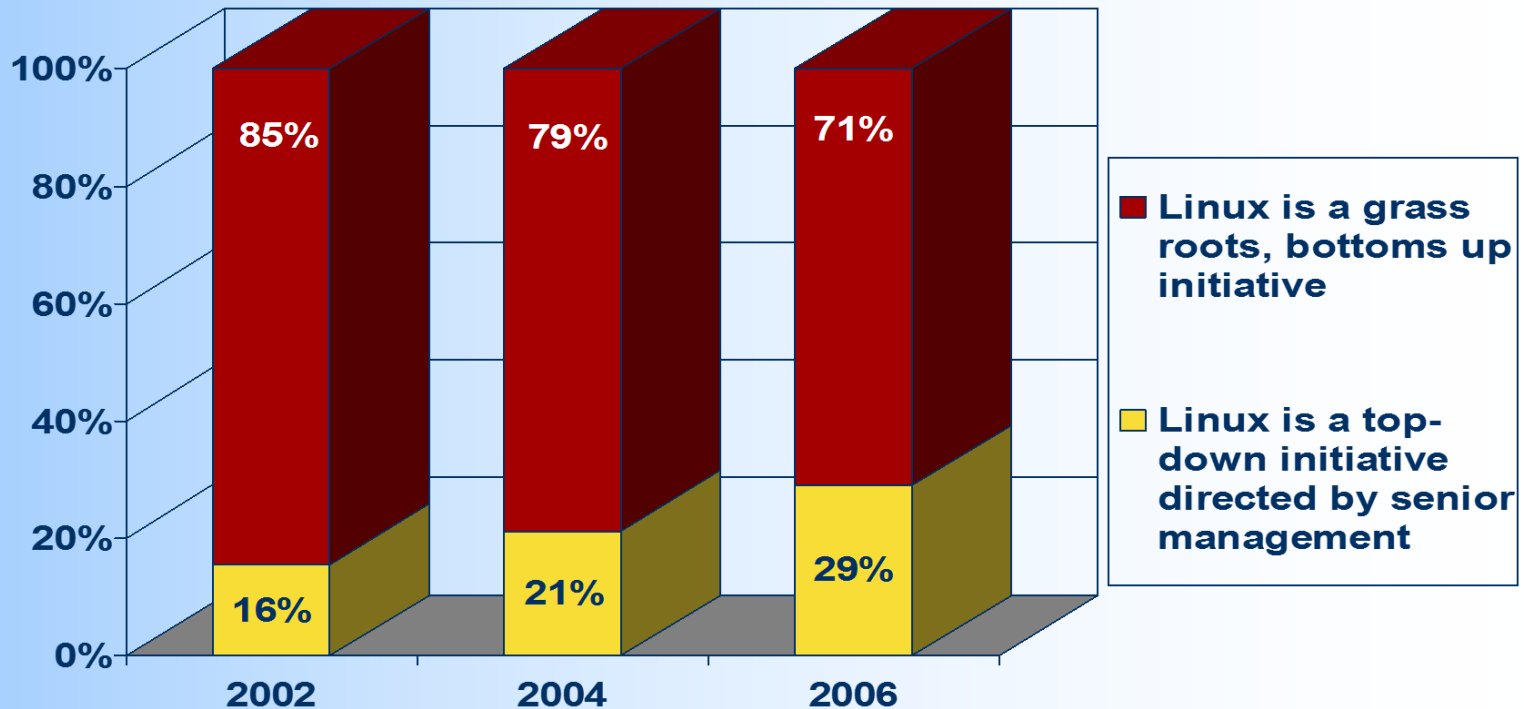
E2b. Which of the following statements best describes your org's strategy and direction regarding Linux on servers?
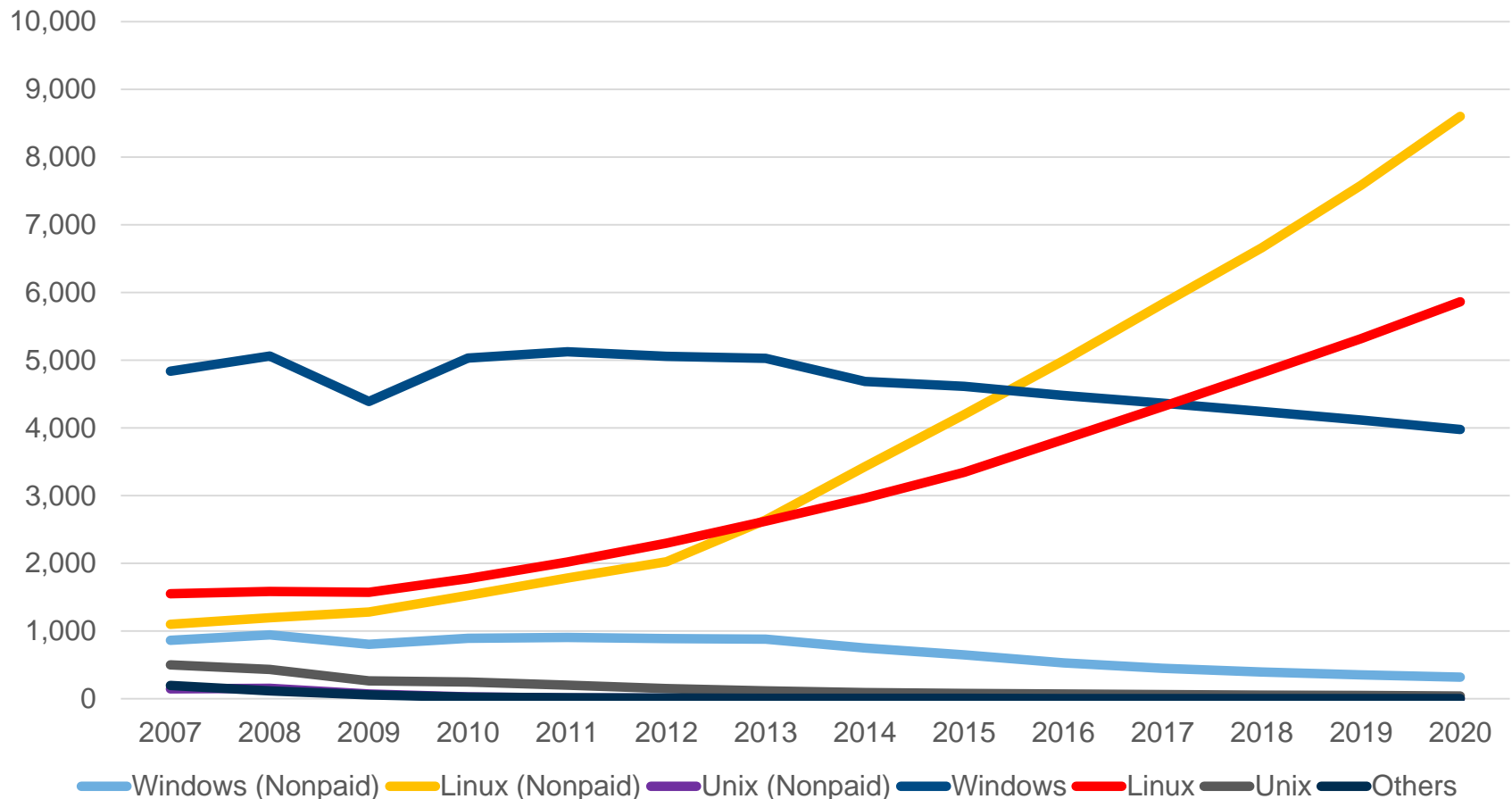
Source: IDC Linux Marketplace Study, 2002, 2004, 2006

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State of the Industry in 2017

- In February 2017….
  - Donald Trump had just sworn in as 45rd president
  - Stock market surpassed 20,000 for the first time
  - Ubiquity of online content, social media fosters info overload; mass dissemination of misinformation
  - Dell-EMC Merger recently completed
  - HPE paring back SW portfolio w/sale to Micro Focus
  - Amazon and VMware announced cloud partnership
  - MSFT acquires LinkedIn; Xamarin; joins Linux Foundation

Paid vs. Nonpaid Server OS Forecasts

Worldwide Operating Systems Shipments, Subscriptions and Nonpaid Deployments, 2007-2020 (000)

Legend: Windows (Nonpaid), Linux (Nonpaid), Unix (Nonpaid), Windows, Linux, Unix, Others

Source: IDC System Software Research, December 2016

Digital Transformation Becomes Key

Standardization of Infrastructure

Interconnection of Systems

Intellectual Property

Social Data, Mobile Data

IoT and Other Data

Decision Support

Real Time Analytics

Source: IDC Developer Research, December 2016

Digital Transformation Made Possible by Open Source Technologies including Containers, Cloud Native Apps

To remain competitive:
- Embrace standardized infrastructure
- Modernize apps application
- Embrace DevOps, priv/pub cloud

Standard infrastructure enables:
- Rapid iteration
- Disruption of competitors
- Deployment flexibility

Source: IDC
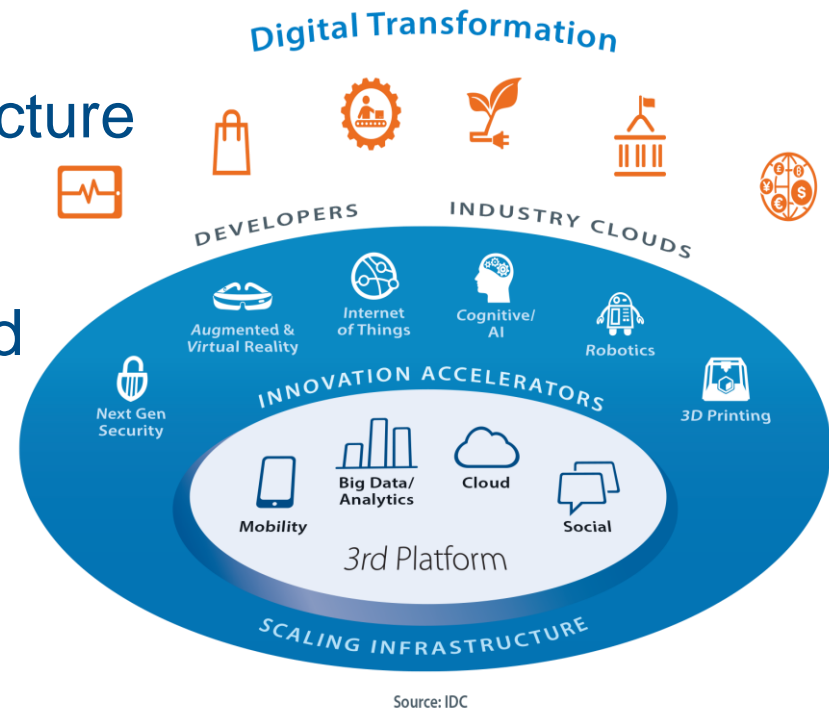
Applications Become the Pivot Point

- Apps divide into "legacy-" and "cloud-native" apps
  - Most of today's installed apps will eventually move to, and live on in cloud … forever
  - Few applications become true cloud applications; even *fewer need to*
  - Expect a lot of "lift and shift" where existing apps are plunked into a container and run in cloud, in their full monolithic glory

- Starting points dictate end points for existing applications
  - MSFT will move Win apps to MSFT cloud
  - VMware unlikely to migrate Windows apps off Windows
  - Linux apps move to public cloud on Linux

- Cloud native apps will emerge as the new battleground
  - Every vendor is scrambling to field a viable CNA strategy
  - Opportunities grow to mange, migrate and lifecycle legacy apps
  - CNAs will present opportunity, but expect a round of consolidation among current high-flying startups in the CNA space.

# How Customers Feel About Infrastructure

- Classic apps are married to a given OS/system software stack
- Cloud native apps _not_ married in the same way, but….
- Transitions are slow, but most growth is in new deployments
- Virtualization was a key enabler, but today is at a crossroads
- Standardization remains one key focus area for IT
  - Standardization is a precursor for future cloud adoption
  - Meanwhile, virtualization still a key onramp for private/hybrid cloud
- Application design is fundamentally changing
  - OS APIs are something to be avoided, not embraced
  - App frameworks key to next generation PaaS adoption
  - Old apps stay on current framework, probably forever

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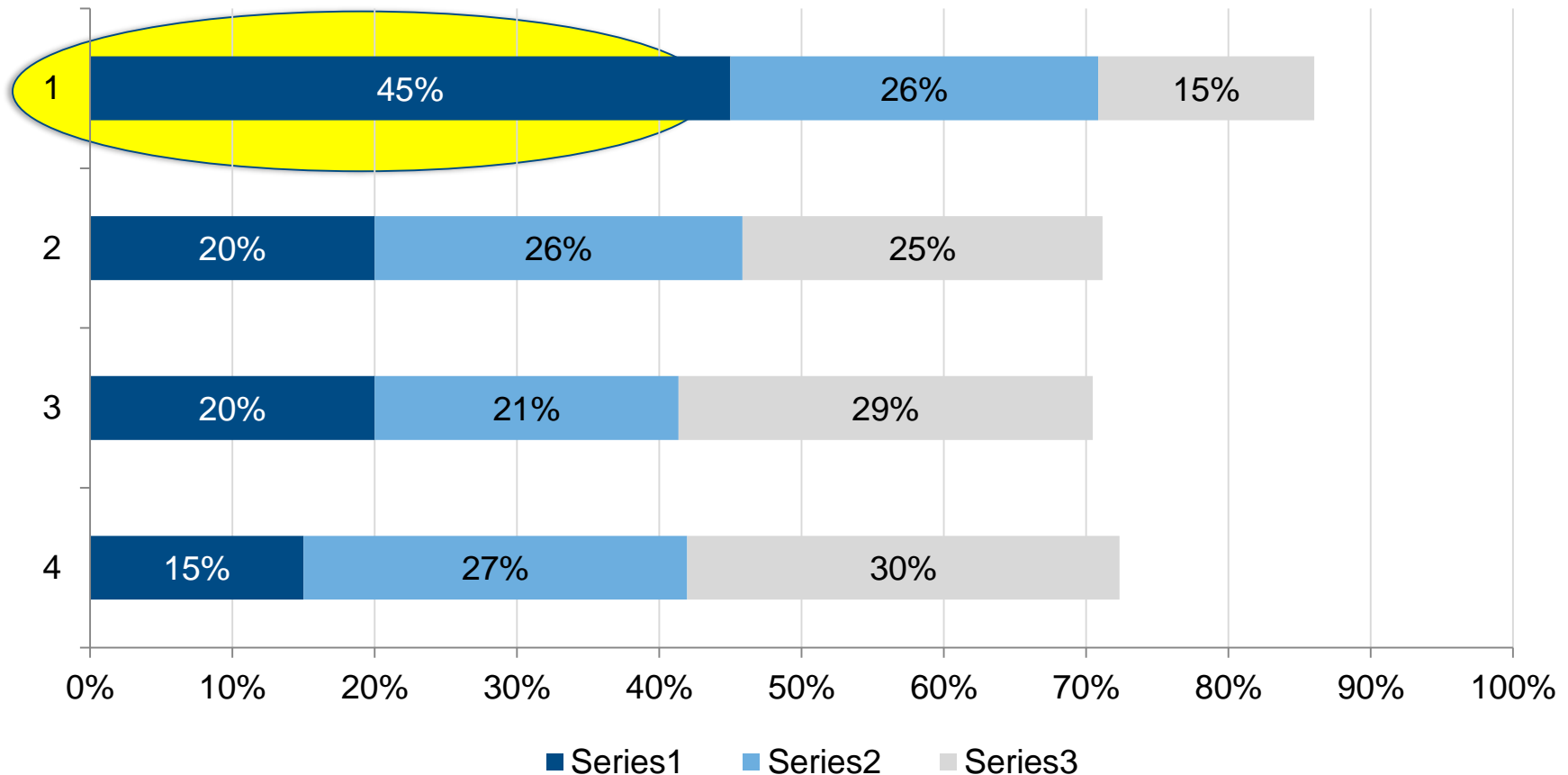- o **Essential Guidance**

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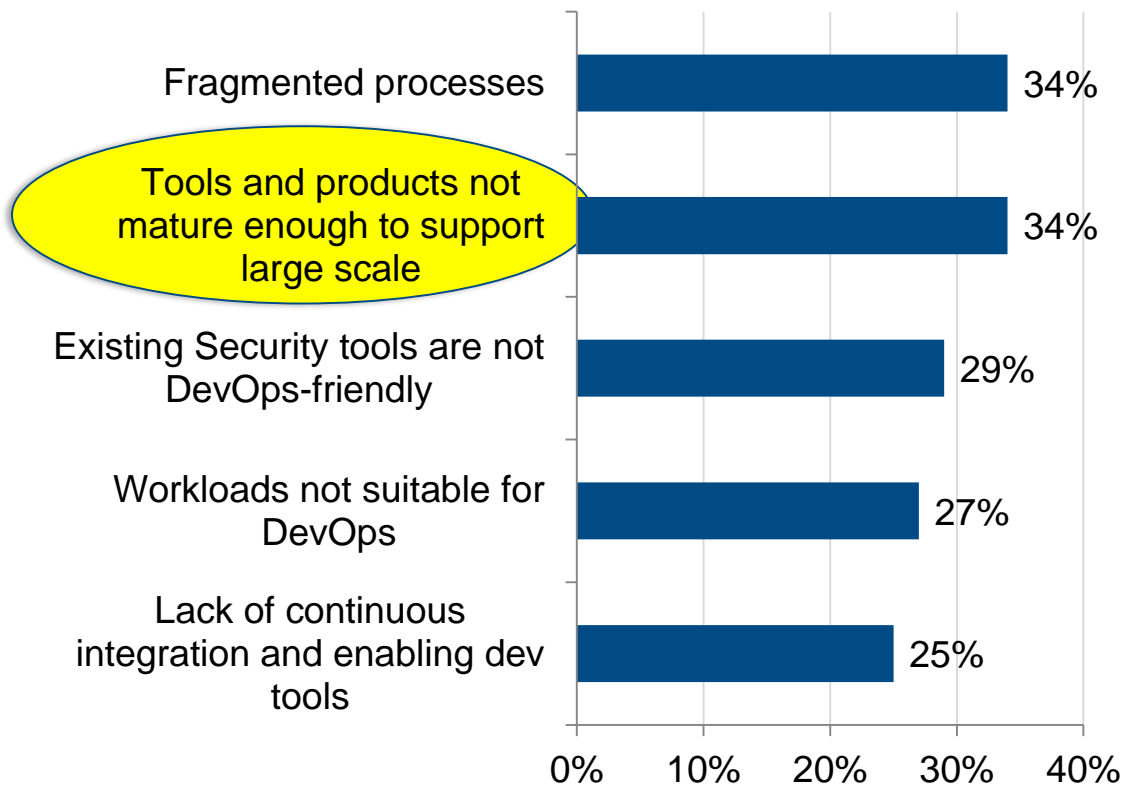
Open Source in Today's World
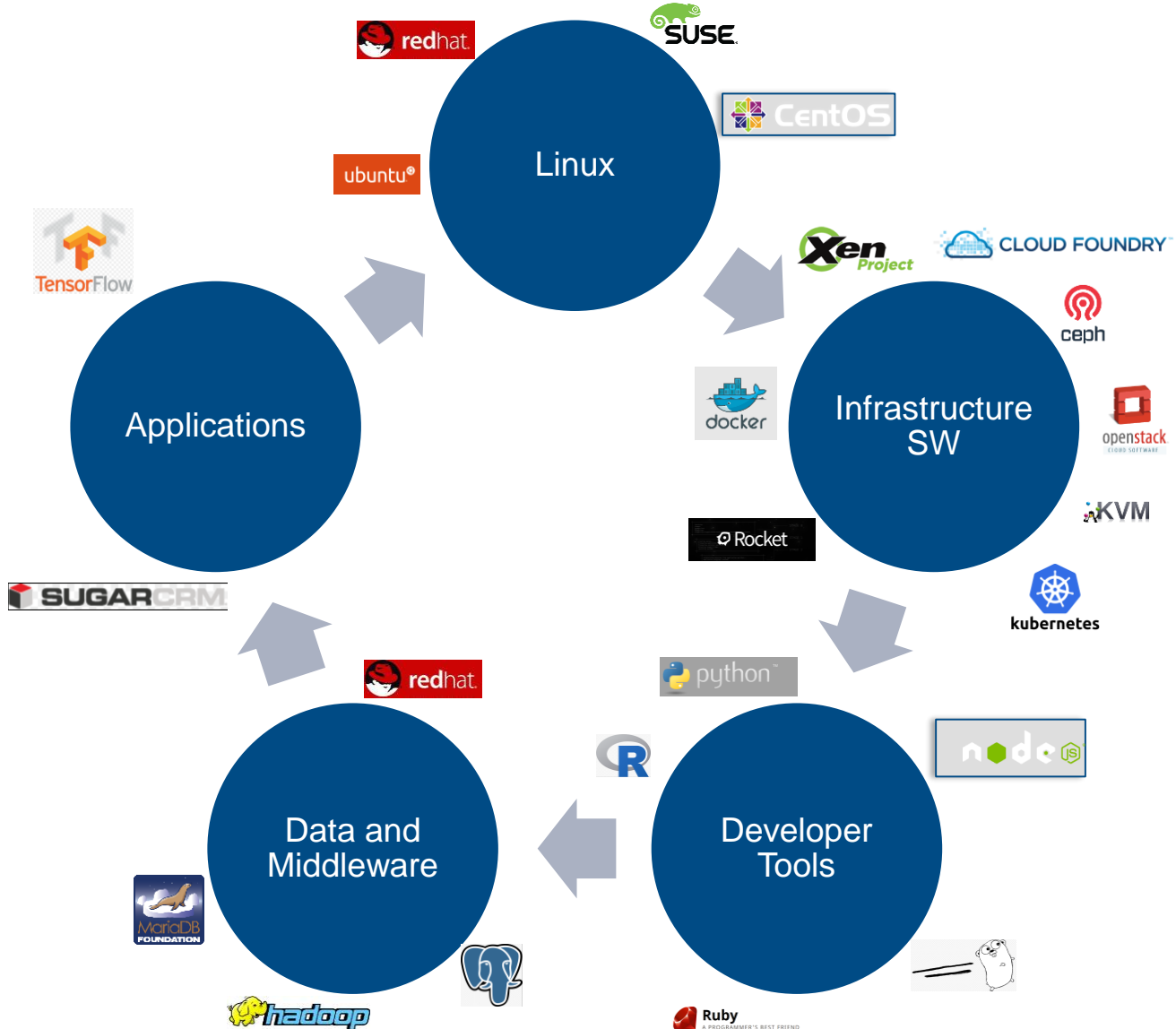
Enterprises Prefer Commercialized DevOps Open Source Products Technologies

Q: Rank order your organization's preferences for sourcing options that will be used to acquire DevOps enabling technologies over the next two years with 1 as the most preferred type

Rank	Series1	Series2	Series3
1	45%	26%	15%
2	20%	26%	25%
3	20%	21%	29%
4	15%	27%	30%

■ Series1 ■ Series2 ■ Series3

n = 100 multiple selections permitted Source: IDC, Early Adopter DevOps Survey, IDC, July, 2016

IDC Analyze the Future

Process Fragmentation, Lack of Mature Product DevOps Challenges

Q: What are your organization's top technology challenges when implementing DevOps?

Challenge	Percentage
Fragmented processes	34%
Tools and products not mature enough to support large scale	34%
Existing Security tools are not DevOps-friendly	29%
Workloads not suitable for DevOps	27%
Lack of continuous integration and enabling dev tools	25%

- Smaller enterprises more likely to think workloads are not suited for DevOps

- Largest orgs most likely to suffer from fragmented processes

n = 100 multiple selections permitted Source: IDC, Early Adopter DevOps Survey, IDC, July, 2016

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Essential Guidance

- Cloud native apps will be architected very differently

- App frameworks, data structures, deployments changing

- Cloud-native apps seek to be more platform independent

- A Darwin evolution of containers + orchestration not done yet

- Development of containerized apps still in infancy among large organizations; but adoption will become strong

- Most existing apps won't be replaced/rebuilt; rather will be augmented and extended using cloud native apps

- Open source software is increasingly becoming the foundation for modern apps, and the tooling for building them

- Training, skills enablement has been, continues to be a drag

Thank You

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