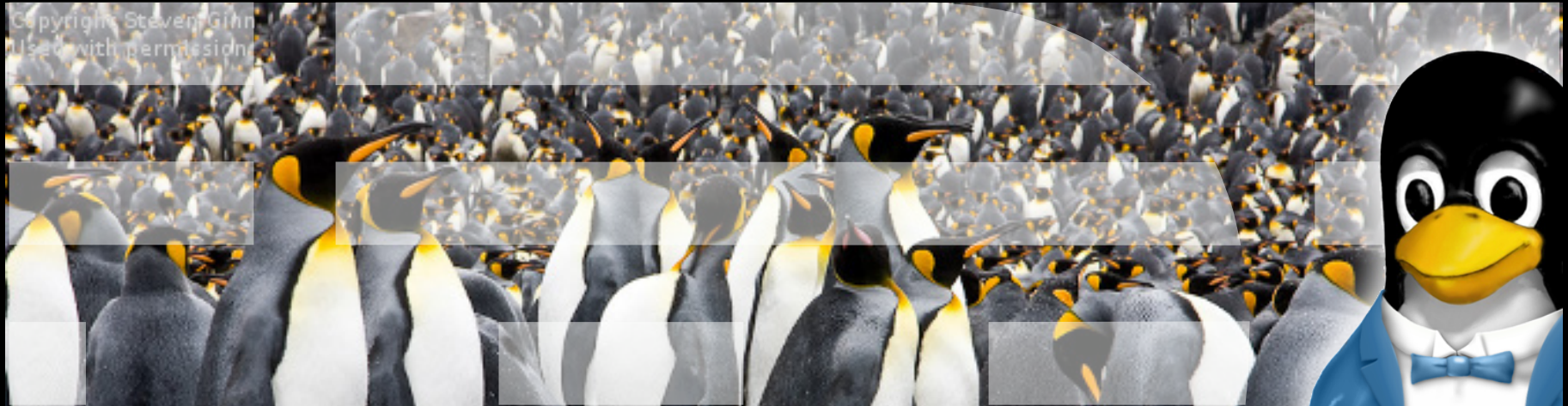


Linux as a Catalyst for a Smarter Planet

Jean Staten Healy
Director, Linux Strategy
IBM

Bob Sutor
VP, Open Source and Linux
IBM Software Group



Copyright Steven Ginn
Used with permission

Global forces are driving a fundamentally different world



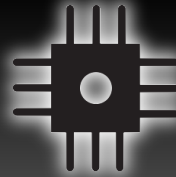
The global financial crisis changed business priorities – and the IT that supports it

The business landscape is evolving, and IT must evolve with it

Technology has enabled solutions that weren't feasible in the last downturn

Fast-developing communities drive constant technology change

Something meaningful is happening



Our world is becoming

INSTRUMENTED



Our world is becoming

INTERCONNECTED



Virtually all things, processes and
ways of working are becoming

INTELLIGENT

The opportunity for progress is clear

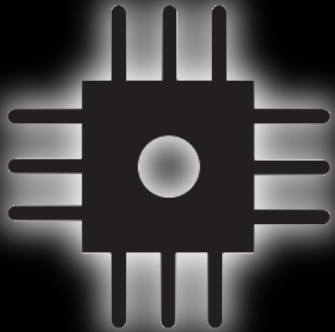
INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of everything

- There are 1 billion transistors for each person on the planet¹

Everything will become instrumented:

- Supply chains
- Healthcare networks
- Cities
- Natural systems



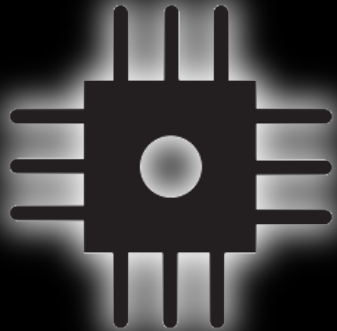
The opportunity for progress is clear

100%

Analog electric meters replaced with smart devices in Malta

Monitoring quality and optimizing consumption

The Maltese National Electricity and Water Utilities — Enemalta Corporation (EMC) and Water Services Corporation (WSC), use Red Hat Enterprise Linux to implement a nationwide smart grid for electrical and water service



The opportunity for progress is clear

INTERCONNECTED



People, systems and objects can communicate and interact with each other in entirely new ways

- Almost one third of the world will be on the web by 2011¹

The Internet of connected devices...

- Cars
- Appliances
- Roadways
- Pipelines
- Livestock

...is headed to 1 trillion.

The opportunity for progress is clear



70%

PERCENT OF SAO PAULO'S EMISSIONS DUE TO 6,000,000 CARS

Improving quality of air (and life) with vehicle testing

As the 7th largest city in the world and the 5th most polluted, Sao Paulo decided to control vehicle pollution through a new distributed vehicle inspection system, enabled by a scalable, robust, and secure infrastructure built on Red Hat Enterprise Linux

The opportunity for progress is clear

INTELLIGENT



We can respond to changes quickly and accurately, with better results

- 15 petabytes of new information are generated every day¹
- An average company with 1,000 employees spends \$5.3 million a year to find information stored on its servers¹

New computing models and advanced analytics use the massive amounts of generated data to become smarter

The opportunity for progress is clear



2.2 Million

DISPENSING ERRORS FROM HANDWRITTEN PRESCRIPTIONS¹

Improved patient care and research through informatics

A North American research hospital uses Linux to align internal processes and create a robust, closely governed data warehouse, improving quality of patient and research data, reigning in costs, and improving efficiency

The progress to date is inspiring...



Smarter cities like Dubuque, which will be enabled by a Linux-based cloud and analytics from IBM



In 1910, only 16 cities had 1M or more people.

In 2010, the number has grown to 450.

«—»

In 2007, half of the human population lived in cities.

In 2050, the concentration will increase to 70%.

The progress to date is inspiring...



Smarter medicine: Astellas Pharma reduces drug discovery with Linux clusters from System x



In a major hospital, stents costing \$25k often disappear

«—»

In a clinic, a patient receives repetitive tests due to out-of-date medical records

«—»

HealthGrades estimates 195,000 patient deaths are avoidable¹

The progress to date is inspiring...



Smarter oil and gas exploration with Shell, simulating more and speculating less



Projected demand for energy is expected to increase by 50% from 2005 to 2030



Only 33% of oil is pulled from existing reservoirs



A 1.5% improvement in oil recovery can yield 6 months of consumable oil

The progress to date is inspiring...



Smarter traffic systems in Stockholm, driven by Linux

In the US, urban populations grew by 20% from '82 – '01

«—»

Traffic grew 236%

«—»

Building new roads and new lanes is no longer feasible in many urban areas

Yet the reality can seem daunting...

Numerous system integrations are required to make *“anything”* smarter

Tremendous analytic power is needed to discover *“new treatments for cancer”*

Massive amounts of data flowing from hundreds of thousands of *“smart meters”* must be read multiple times per hour

Staggering numbers of images must be captured, stored, managed and linked to *“billing and collection systems”* in real time

Especially in light of today's challenges

41%

of data center managers claim their data centers will max out their energy capacity within one to two years¹

Processor power doubles every 18 months,

but 85% of this power sits idle²

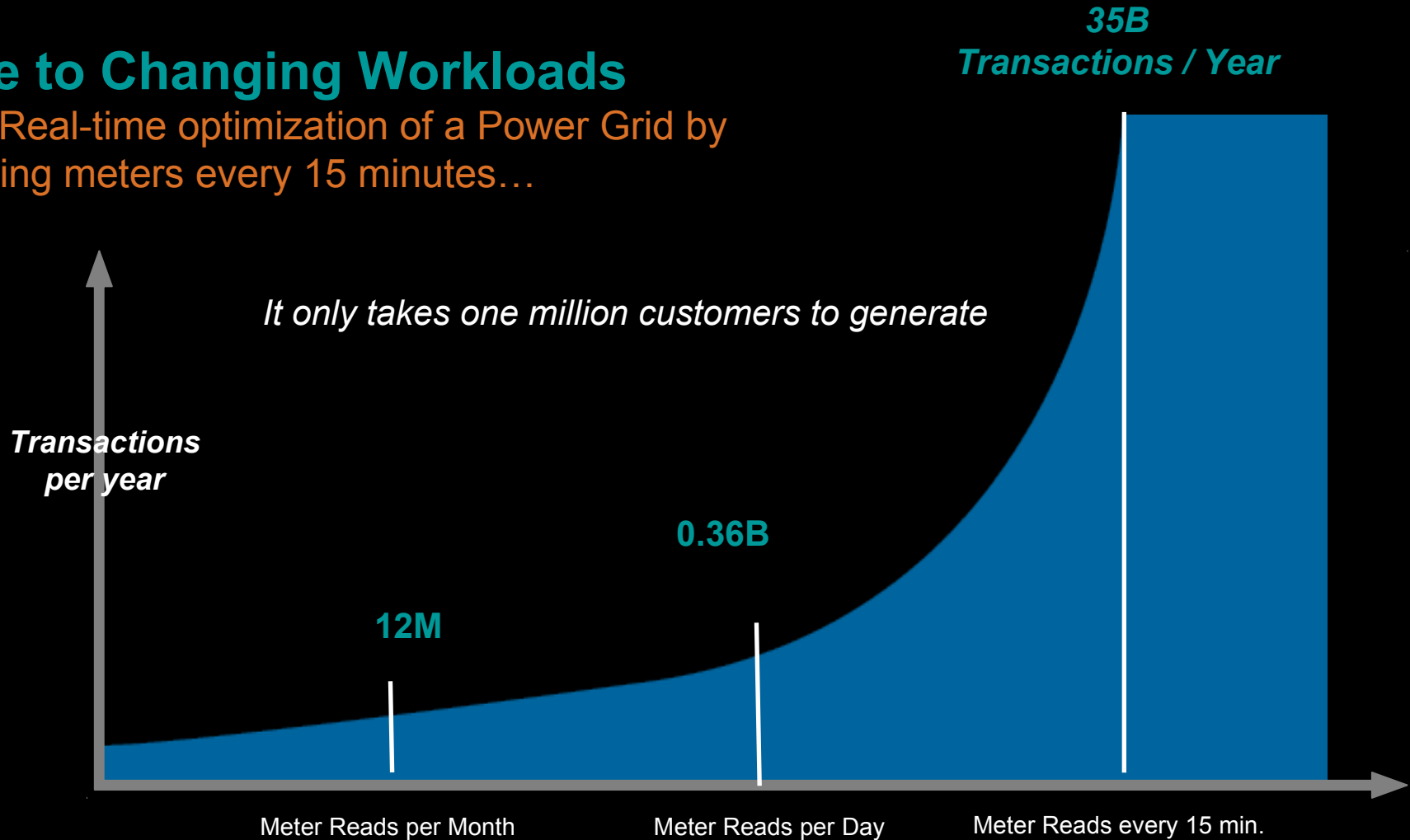
80%

of digital data is now unstructured³ and requires greater effort to transform it into usable intelligence

Requirements are changing for a more instrumented, interconnected, intelligent world

Due to Changing Workloads

e.g. Real-time optimization of a Power Grid by reading meters every 15 minutes...



Linux is at the core of the datacenter, and a smarter planet

Linux continues to enable new ways of doing business



Edge and Web Infrastructure

- Community focus
- Internet enabled
- Worldwide Volunteers

Application and Data Serving

- Commercial focus
- Open elements of IT industry join community
- Enterprise Linux adoption grows

Business-Critical Workloads

- Competitive focus
- Extensive use for DB, BI, ERP, CRM
- Cornerstone of IT strategies
- Steady adoption through downturn

Next Generation Workloads

- Leadership focus
- Accelerated adoption
- Workloads drive platform decision
- Cloud / flexible allocation models
- Fully established for business-critical use

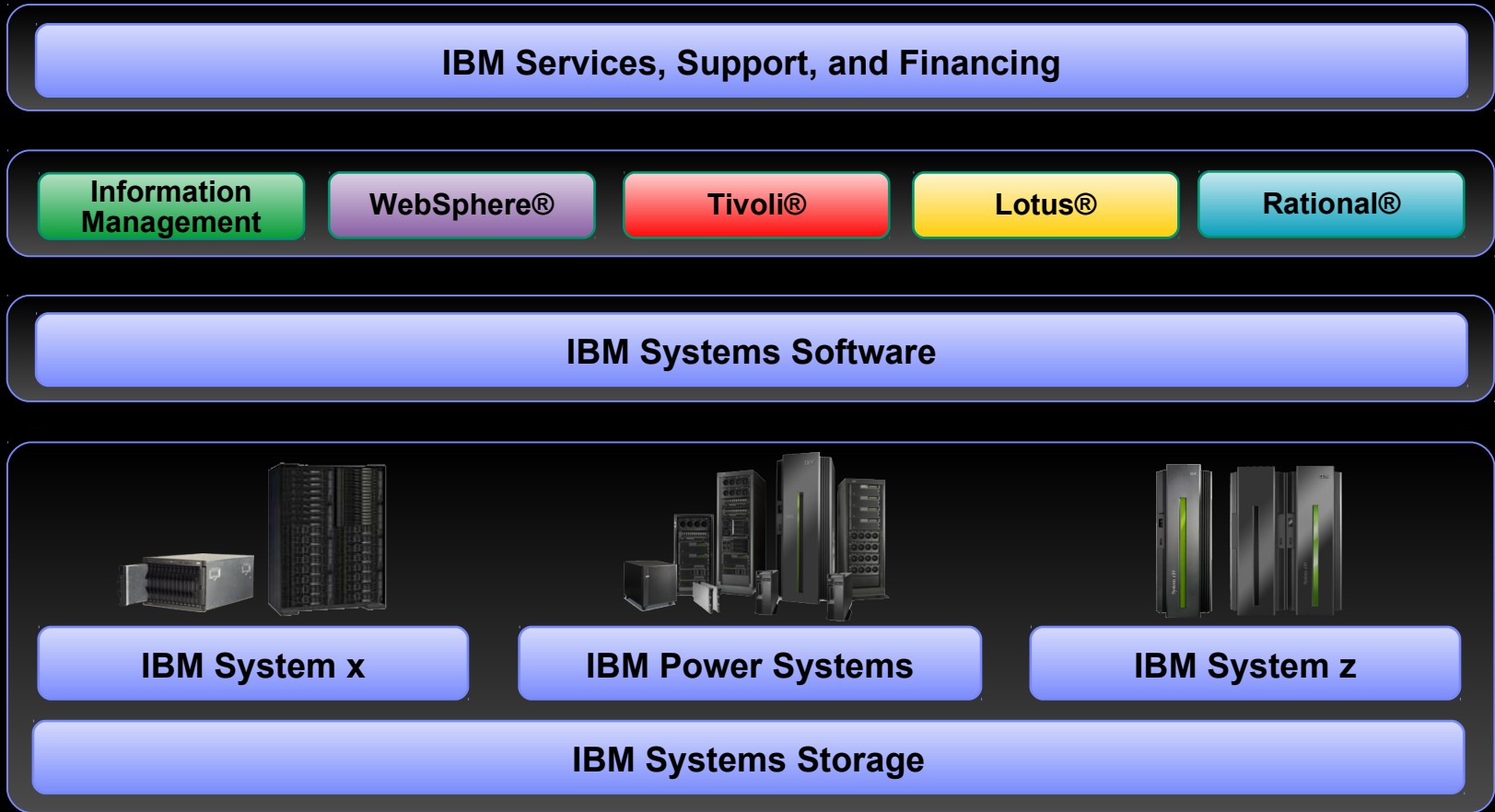
1991 – 2004

2005 – 2006

2007 – 2009

2010+

IBM provides complete Linux solutions: top-to-bottom, end-to-end



Smarter solutions with Linux start with IBM

Cost matters

Flexibility matters

Innovation matters

IBM provides leadership solutions with Linux, top to bottom, end to end

- Choice of supported hardware
- Enterprise-grade middleware
- Implementation and support services



© Steve Ginn
Used with permission

Legal

Trademarks and Disclaimers

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries:

IBM, the IBM logo, ibm.com, Smarter Planet and the planet icon, BladeCenter, Power, System Storage, System x , System z, WebSphere, DB2 and Tivoli are trademarks of IBM Corporation in the United States and/or other countries. For a complete list of IBM trademarks, please see www.ibm.com/legal/copytrade.shtml

The following are trademarks or registered trademarks of other companies:

Java and all Java based trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries or both. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. UNIX is a registered trademark of The Open Group in the United States and other countries or both. Linux is a trademark of Linus Torvalds in the United States, other countries, or both. Cell Broadband Engine is a trademark of Sony Computer Entertainment Inc. InfiniBand is a trademark of the InfiniBand Trade Association.

Other company, product, or service names may be trademarks or service marks of others.

NOTES:

Linux penguin image courtesy of Larry Ewing (lewing@isc.tamu.edu) and [The GIMP](#)

Any performance data contained in this document was determined in a controlled environment. Actual results may vary significantly and are dependent on many factors including system hardware configuration and software design and configuration. Some measurements quoted in this document may have been made on development-level systems. There is no guarantee these measurements will be the same on generally-available systems. Users of this document should verify the applicable data for their specific environment.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

Information is provided "AS IS" without warranty of any kind.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices are suggested US list prices and are subject to change without notice. Starting price may not include a hard drive, operating system or other features. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Any proposed use of claims in this presentation outside of the United States must be reviewed by local IBM country counsel prior to such use.

The information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any.