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How the Post-PC era changed IT

Ubuntu for next gen datacenters

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Welcome to the **Post-PC Era**

An era where the personal computing is moving from the desktop form factor to more ubiquitous computing such as netbooks, smartphones, Tablet, Smart Television and in-vehicle entertainment systems.

Post-PC impact on Server Side



- Incredible number of devices connected to the network
- So many clients, so many requests
- High demand for scalable-mission critical systems and architectures
- Distributed non-relational data, also known as “big-data”
- Reduced needs for huge server(s) in small business

What all these devices have in common?



The ARM Processor



- ARM is a 32-bit RISC architecture (coming to 64-bit)
- Supports multi-core (up to 4 cores)
- Available from many vendors: FreeScale, nVidia, TI, Marvell,
- Advantages: low power consumption, low cost
- Largely used in client devices....
- ... but ...



... power consumption and assembly costs sounds interesting in the server side. In particular:

- 1) In small and medium business they can replace single-servers with “micro-servers” such as smart-NAS
- 2) In large datacenter, where cooling and power are important costs, ARM allows more server density.

Drivers for ARM Servers in the data centre



Data center trends:

- Power = problem - \$26B/yr to power and cool volume servers
- Facilities max'd on power means that there is a CapEx hurdle before deploying more servers
- Web and Cloud workloads are emerging as distinct addressable market

ARM SoCs fast evolving for server workloads

- ARM processors already deliver multicore 2GHz+ performance
- Virtualisation, 64 bit support coming over next 2 years
- Lower power is just the beginning. Re-architecting of the server subsystem , fabric and systems management to further increase the TCO advantages.

Potentially large TCO Advantages (OpEx and CapEx)

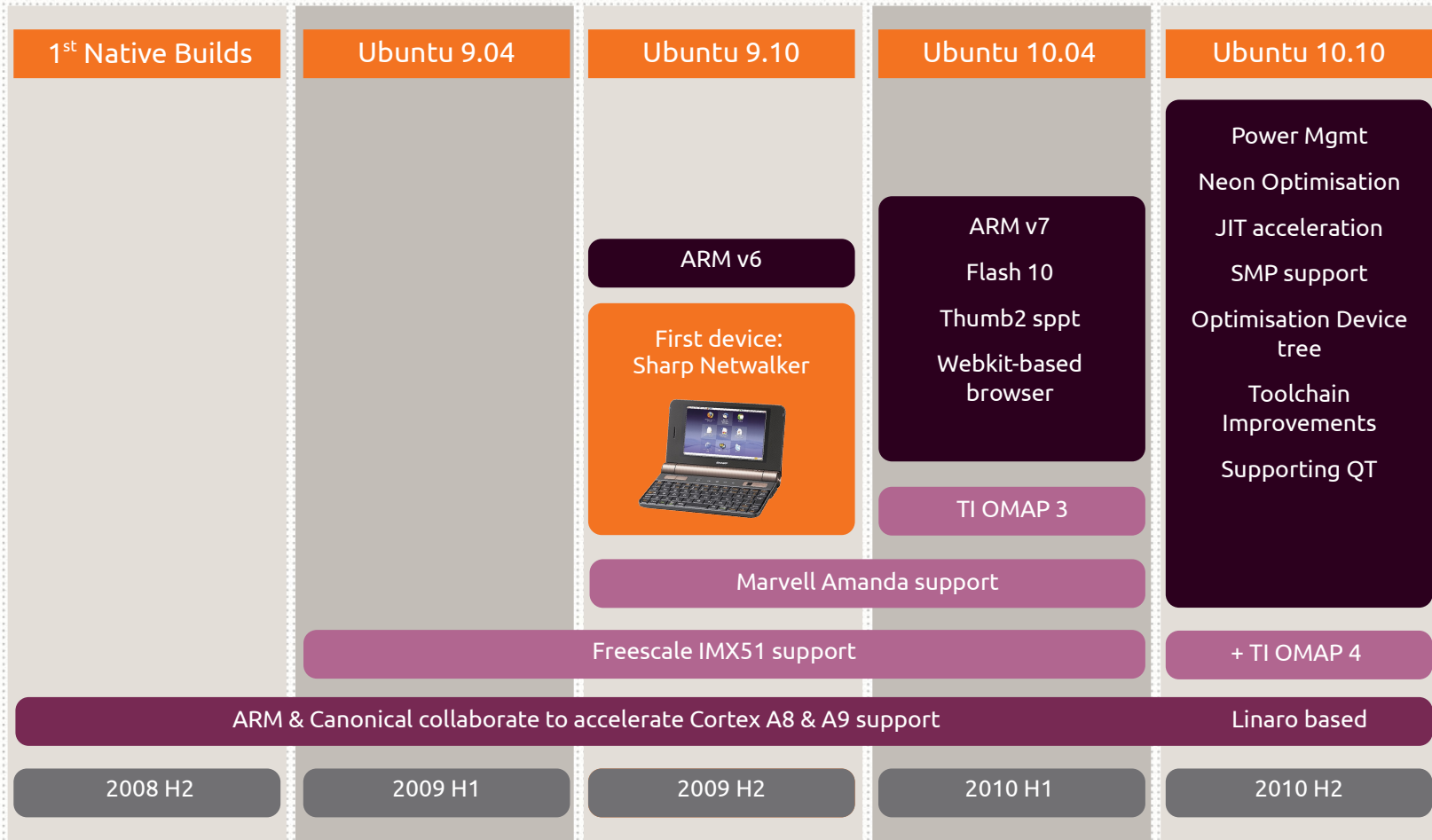
- CapEx driven by lower acquisition costs and higher density at existing data centers
- OpEx drops based on power and cooling



Ubuntu Server 11.10 is the first general-purpose, server-focused operating system that supports the ARM architecture.

Canonical has done significant work to support the architecture with the core OS and with essential high-volume server applications such as the LAMP stack. The ARM architecture is considered to have the potential to improve the performance per watt density of data centers dramatically.

Ubuntu on ARM – Since 2008



Micro-Server for SMB deployment



With clouds being deployed, there's less need for a real server in Small and Medium Business.

Most of the need is an advanced file-storage solution and some generic purposes functions:

- Web server
- PBX (Asterisk)
- Small (local) databases
- Back-up



Datacenter: target workloads



| Web servers | Application Servers | Offline Analytics | Storage Servers |
|--|--|---|------------------------------------|
| Web servers App interfaces Web hosting | Memcached appliances Content delivery | Search indexing MapReduce Finance modelling | Object Storage Swift Gluster |

- Workloads are common LAMP stack workloads
- Workloads that parallel-lize well are obvious targets
- Systems Management becomes even more important when you look at the node density possible with ARM boards in blades



The perfect workload for ARM in the Web 2.0 architecture, where millions of clients are trying to access the same resource (such as Facebook, twitter, ...)

- **Cassandra** is an open source distributed database management system that is designed to handle very large amounts of data spread out across many commodity servers while providing a highly available service with no single point of failure
 - **MapReduce** is a software framework introduced by Google to support distributed computing on large data sets on clusters of computers. A number of clones can implement the same framework, such as Hadoop
 - **Web Servers** and **Application Servers** that are able to serve million of pages in a flexible ways
-



- Big Data generally refers to database applications that manage Non-Relational or Unstructured data.
- Differences occur in the consistency model, the data model and therefore workload suitability
- Big Data applications are used extensively by companies with huge amounts of unstructured data (Facebook, Google, Yahoo etc..) but increasingly more traditional enterprises (Banks, Power companies, Telcos, Govts) are seeing the value in being able to process huge amounts of this type of data quickly.

Why Ubuntu Server on ARM?



Perfect match on target workloads

- Ubuntu is strongest in the areas that ARM will break into – Webservers, Hadoop & Cloud workloads.
- Popularity with developers will accelerate the very patching of FLOSS apps and ISV apps that is needed to see growing support for ARM in the ecosystem.

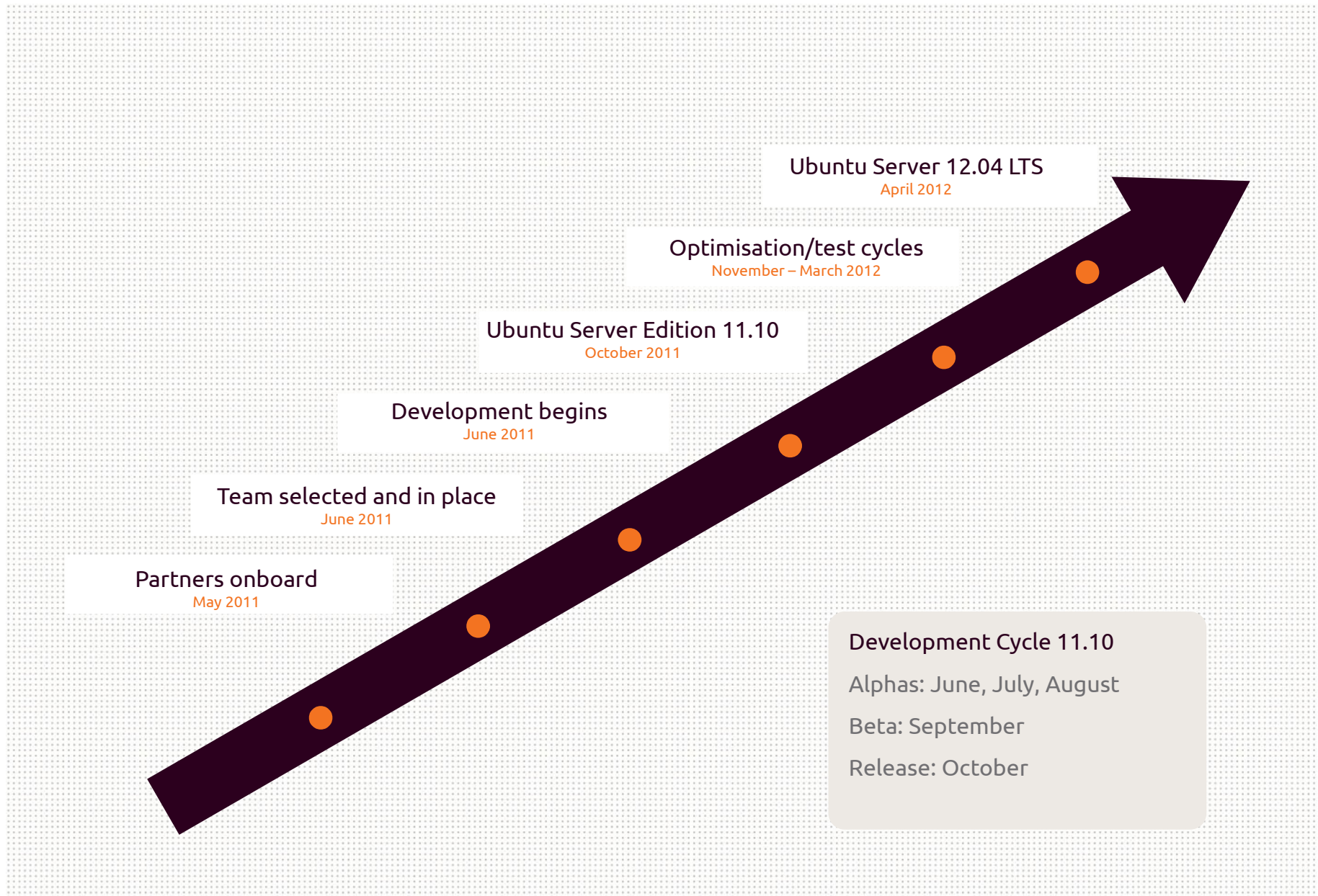
ARM experience

- Canonical have worked for three years with ARM and ARM partners on optimising for Cortex A8 and A9.
- Ubuntu is already natively compiled for Cortex A9 with Thumb2 optimisation and support for NEON switched on
- Ubuntu fully supports all Linaro optimisations and is the leading adopter of work from Linaro.

Ideal business model

- Canonical charges for Services not for bits. Customer do not pay for security patches or updates.
- Hyper-scale users (target market) strongly desire this model. This model also lends itself very neatly to Cloud deployments

Timeline



Example case studies



Render Farms



Weta Digital

- Ubuntu used to render Avatar and King Kong
- 35,000 cores in 5,000 HP Blades with 104TB RAM

VDI Infrastructure



Guateng Province, SA

- Centralised data-centre providing infrastructure to 2M pupils in 1,200 schools
- 1500+ Dell Servers

Government Cloud



CabinetOffice

- British government team responsible for showing better IT patterns by using new technologies . Infrastructure built out on Ubuntu

File and print servers



Internal file and print servers running on Ubuntu

Hosting



Rackspace

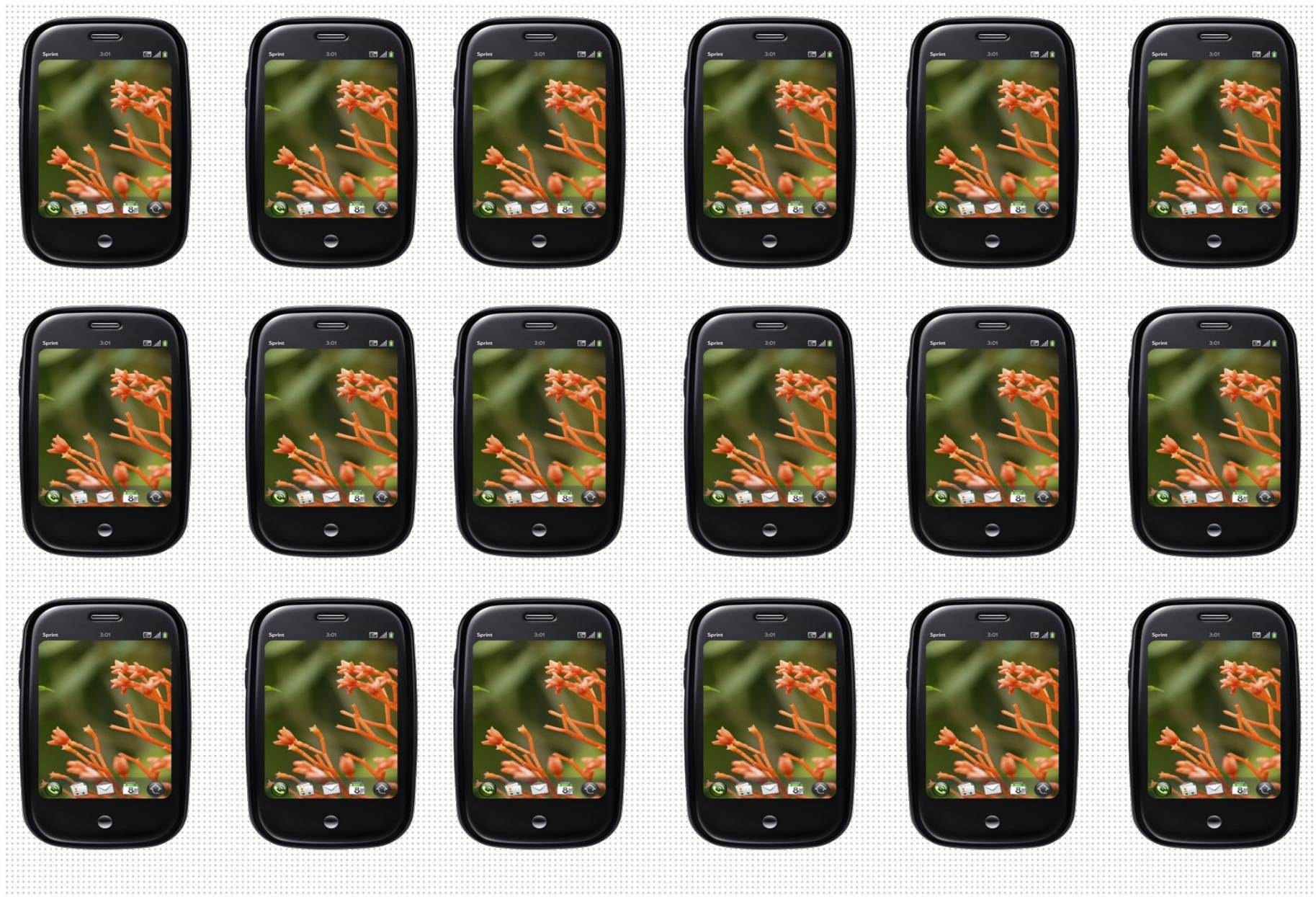
- Over 50,000 Ubuntu Servers

Web 2.0



Web 2.0, social networks, online gaming, hosting service providers, public cloud providers, and startups prefer Ubuntu

This will be your next datacenter





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Questions please
Thank you

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