

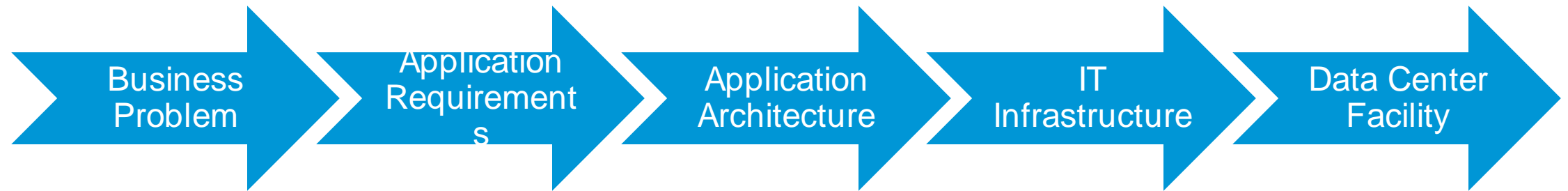


The HP IT Transformation Story

Continued consolidation and infrastructure transformation impacts to the physical data center

Dave Rotheroe, October, 2015

Why do data centers exist?



The Total Cost of Ownership of the entire stack is what is important

HP Data Center landscape - 2005



- 85+ data centers
- 750,000 sq. ft.
- 13,000 racks
- 6% annual increase

HP global Data Center locations 2009

– Global consolidation:

- 85+ global data centers → 6 Tier III Sites
- grouped into pairs
- 1 pair per geographic zone

– 3 Geographical Zones:

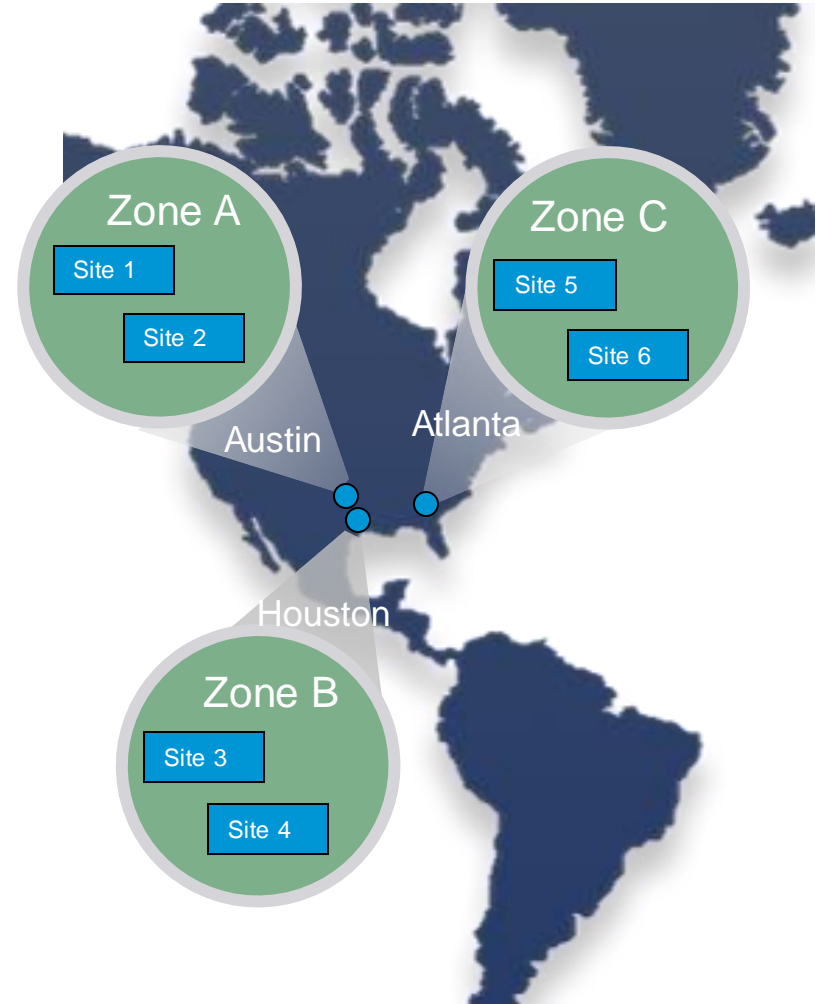
- Atlanta
- Austin
- Houston

– Chosen for:

- Proximity to major fiber optic backbones
- Access to multiple power grids
- Costs

– Total white space over 400,000 sq. ft.

- 2 sites within 10-25 mile radius of each other
- Each site designed for high availability, disaster recovery and business continuity



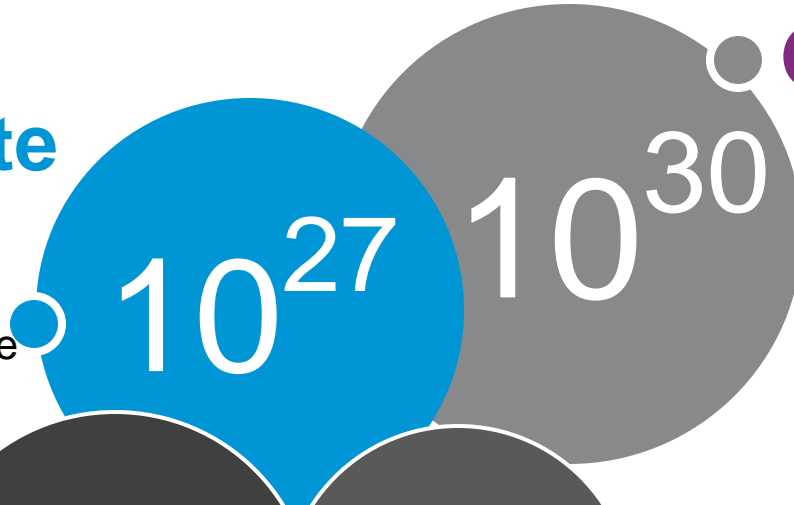
IT Technology Trends



Data is getting really big and really fast

Brontobyte

In the near future, **Brontobyte** will be the measurement to describe the type of sensor data that will be generated from the IoT

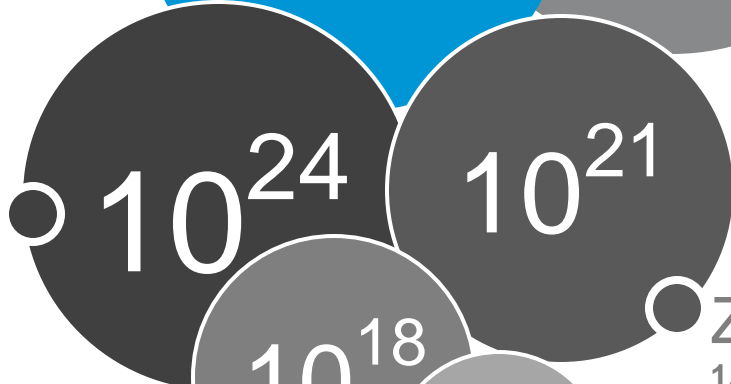


Geopbyte

This will take us beyond our decimal system

Yottabyte

Today data scientist uses **Yottabytes** to describe how much government data the NSA or FBI have on people altogether.



Zettabyte

1.3 ZB of network traffic by 2016

Exabyte

1 **EB** of data is created on the internet each day = 250 million DVDs worth of information. The proposed **Square Kilometer Array telescope** will generate an **EB** of data per day

Petabyte

The **CERN Large Hadron Collider** generates **1PB** per second

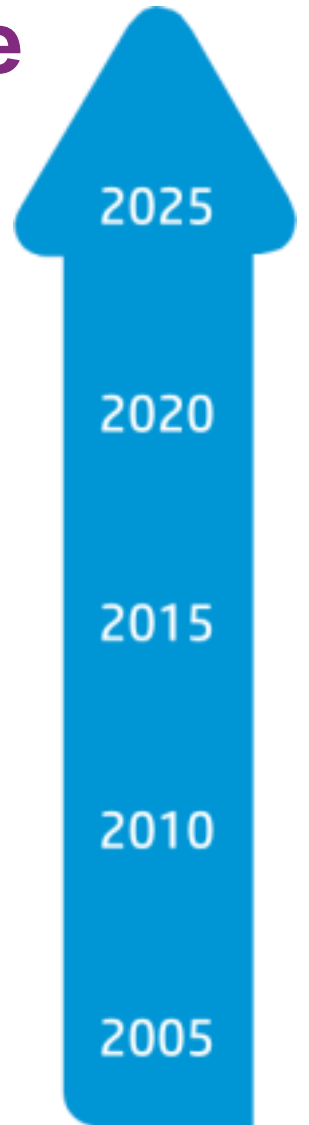
500TB of new data per day are ingested in **Facebook** databases

Terabyte

Terabyte

Gigabyte

Megabyte



Hardware

All vendors are continuing to offer more powerful servers

Industry Standard Servers

- A lot more compute for a lot less money (and electricity)
- Rapidly becoming commoditized
- More powerful than many applications need
- Blades and Rack Mount each have their place



Application Specific Servers

- Designed for a specific workload (web, VDI, BI, HPC...)
- Not a replacement for industry standard servers
- Often overlooked as an option
- Energy savings for compute and facility



Hardware

Storage, Network and Backup continue their evolution as well

Storage

- Cost per terabyte continues to drop rapidly
- SSD's now viable for enterprise data center use
- Encryption options becoming mainstream

Network (including security)

- Speeds evolving to more than match needs
- Security continues to be paramount

Backup

- Disk becoming pervasive
- Tape still makes sense for a few things



Software

Now that we have hardware, what are we going to run on it?

Cloud

- Public, Private, Hybrid – all Finally Real!!!
- Infrastructure utilization can be very high – bringing lower TCC
- Virtual to bare metal and everything in between



Traditional

- Still has a place, just a much smaller place

Converged Solutions and special purpose workloads (HPC, BI...)

- Preconfigured Hardware + OS + Application
- Fully integrated, tested, and configured solutions – roll it in, plug it in, and it just works

SaaS, IaaS, PaaS

- Why spend the CapEx and manage it yourself, if you can rent for the same or less money?

Application Transformation



Typical Enterprise Today

Most large companies are running a mix of ancient to new technology

Lots of old stuff:

- Many discrete rack mount servers
- Many years old SAN and direct attach storage

Middle aged:

- Some virtual farms
- Blades

Some recent:

- Private and/or Public Cloud
- A couple modern BI and/or EDW deployments
- Maybe a few Converged Solutions

And Hundreds, if not Thousands, of Applications

After an application is deployed, there are only seven possibilities:

- Stay on existing infrastructure (for an extended period)
- Migrate to new traditional infrastructure (in your data center)
- Transform to be “Cloud Friendly” on your Private Cloud (in your data center)
- Be replaced with a new application that is “Cloud Friendly” (in your data center)
- Be replaced with an Appliance or Converged Solution (in your data center)
- Be replaced with a SaaS solution or move to an Public Cloud (external to your data center)
- Retire

Power Impact of Each Possible Application Scenario

Percent of original data center power utilized:

- 100% Stay on existing infrastructure (for an extended period)
- 23% Migrate to new traditional infrastructure (in your data center)
- 15% (Mostly) transform to be “Cloud Friendly” on your Private Cloud (in your data center)
- 10% Be replaced with a new application that is “Cloud Friendly” (in your data center)
- 20% Be replaced with an Appliance or Converged Solution (in your data center)
- 0% Be replaced with a SaaS solution or move to Public Cloud (external to your data center)
- 0% Retire

The above are averages from various refreshes – specific applications and your mileage will vary!

Given that, let's look at some scenarios

Assume limited or no SaaS or application transformation – just new hardware

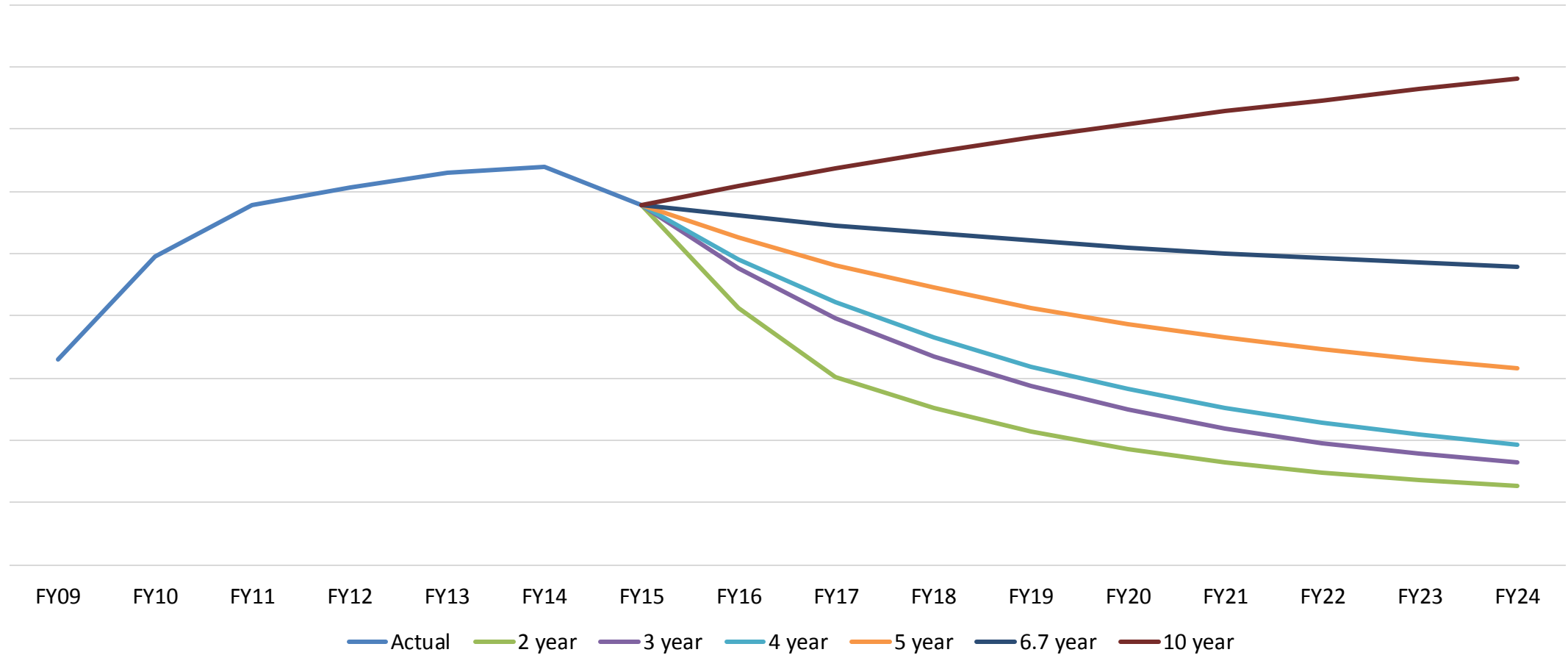
Include some growth each year

Just standard application refresh to new infrastructure in existing data centers

Refresh Rate in Years	Yearly Refresh %	New Demand (MW)
2	50%	0.5
3	33%	0.5
4	25%	0.5
5	20%	0.75
6.7	15%	1.0
10	10%	1.5

Impact of different refresh and growth rates, 100% internal (no SaaS)

Data Center MW Utilized
For different refresh rates
Assuming annual growth and no transition to SaaS or Public Cloud



What are some aspirational goals for an enterprise?

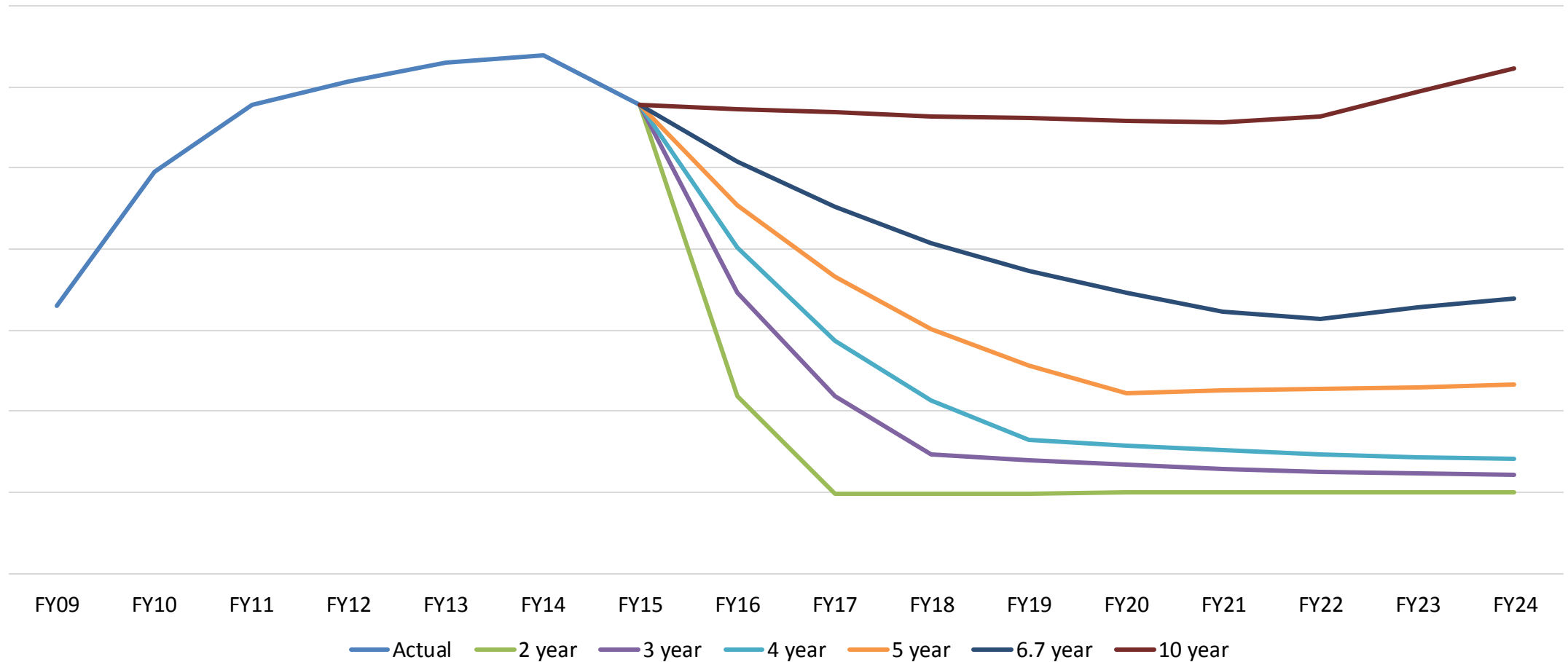
50% SaaS replacement or retire (aggressive and likely unrealistic at this time, but...)

40% Cloud, Other Virtual, or Converged Systems in existing company data center

10% Refreshed Legacy Infrastructure

Impact of different refresh and growth rates, 50% internal, 50% SaaS

Data Center MW Utilized
For Different Refresh Rates
Assuming annual growth and 50% transition to SaaS or Public Cloud



What does this mean?

Depends on who you are...

Most Enterprises will use less data center capacity, and less IT equipment, even if business grows!

- What to do with that extra data center capacity?
- Does it still make sense to own and operate a own a data center?

Co-location, telecom, and managed service firms will continue to grow

- The ones that figure out how to save their customer the most money will be the most successful

SaaS Providers will become pervasive

- Not for everything; most will use a bunch of it

Public and Managed Cloud Providers will grow significantly

- A lot of what runs in an Enterprise data center today will run in a Cloud tomorrow



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- Capacity
- Cost

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Questions & Discussion?

Dave Rotheroe

dave.rotheroe@hpe.com

