



# The Theory of Cloud set to Music



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# Symphonic Metamorphoses on Themes of Enabling Technology™

## Symphony Number 9

Technique – Theme and Variation

Melodic pattern – Cloud

Orchestrated for Healthcare

Key – B #

# Symphonic Metamorphoses on themes of Enabling Technology – Number 9

## **Purpose:**

To increase the participants knowledge of Cloud as an enabling technology and provide a point of view on leveraging Cloud in Healthcare applications.

## **Upon completion of this session the participant will:**

- Obtain a base knowledge on Cloud as an enabling technology
- Understand how the “as a Service” enabler evolved over time
- Gain appreciation for some of the architectural decisions one must make when deploying Cloud applications
- Understand some of the challenges of leveraging “Cloud” using Healthcare as an industry model



# Symphonic Metamorphoses on themes of Enabling Technology – Number 9

## Agenda

- The theme of “Cloud”
- Cloud in terms of Music theory
- The roots of this “theme”
- A Great Hit!
- Composing for the Cloud
- Point and Counterpoint
- Healthcare Theory
- HP “Arranges” and “Composes”
- Questions and Answers
- Conclusion

“Cloud computing will be as influential as e-business”

Gartner

**“When people talk about cloud computing, they're talking just about taking some stuff, putting it outside the firewall, and perhaps putting it on servers that are also shared or storage systems.”**

**Steve Ballmer – CEO Microsoft**

# The Theme of “Cloud”

## Engagement Model

Cloud  
Service  
Provider

Musician

**Provider perspective:**

... all the details related to providing a complete solution, at an attractive price, on a cost structure that leads to a profitable business model are your responsibility.

- You own and manage all of the IT assets
- You assume the specific costs and risks of the service components

An environment where highly scalable and elastic services can be easily consumed over the internet through a low-touch, pay-per-use business model

Cloud  
Service  
Consumer

Attendee

**Consumer perspective:**

...all you need is a device and an internet connection to get the value.

- You don't need software, hardware, technical knowledge.
- You don't own the assets.
- You don't assume the specific costs and risks of the service components

Concert

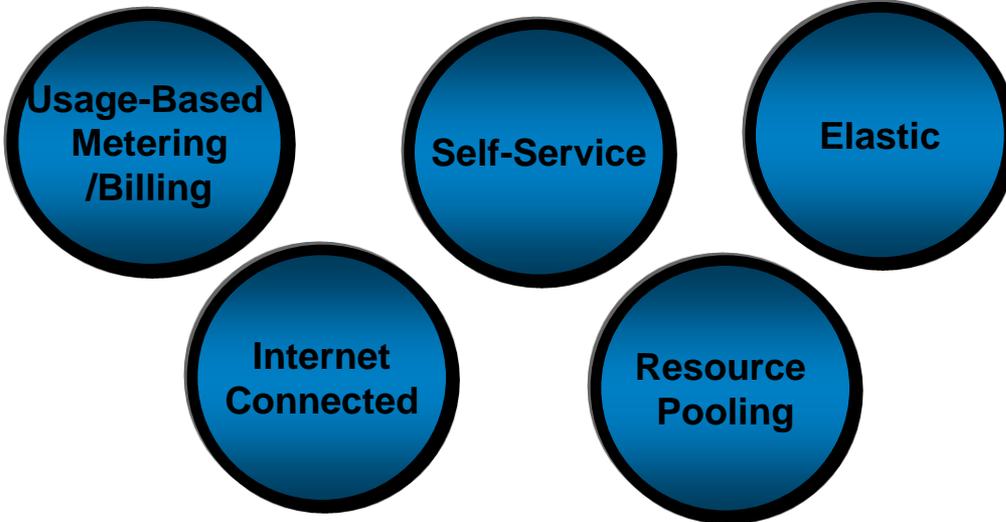
***Two very different  
roles***



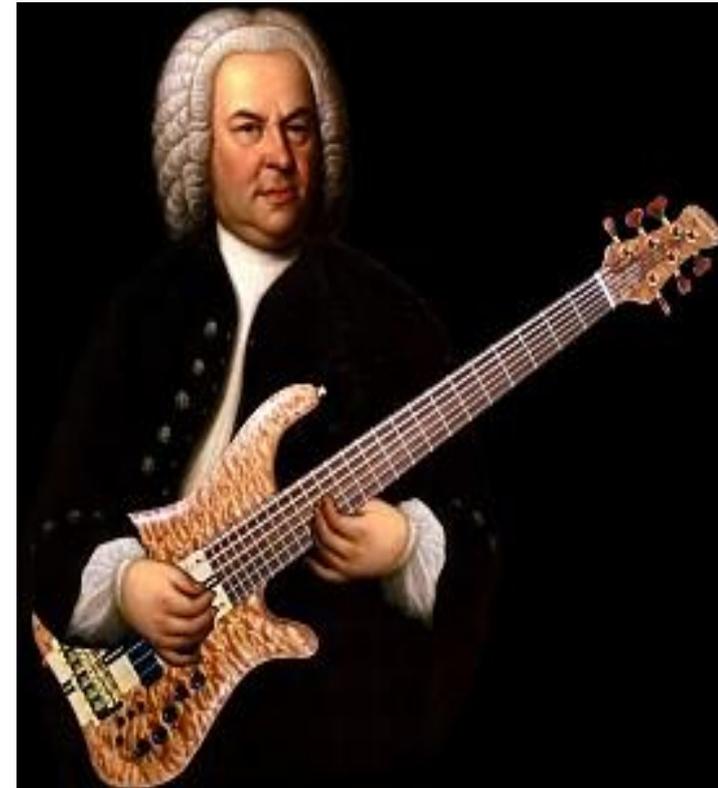
***Two very different  
perspectives***



# The Theme of “Cloud” – Melodic “break down”



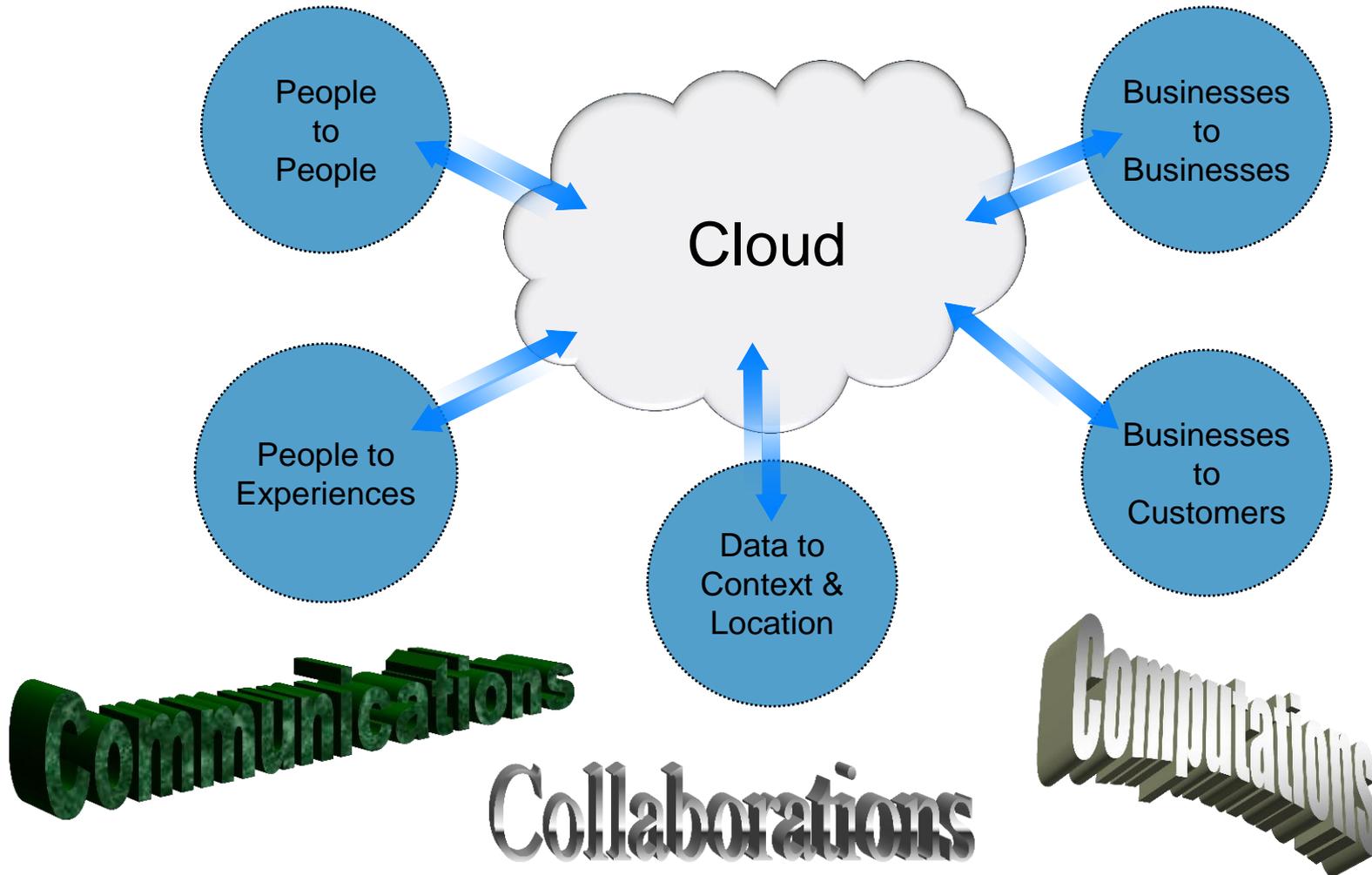
Consumers of the “Cloud” are concerned with services it can perform rather than the underlying technologies used to achieve the requested function.”



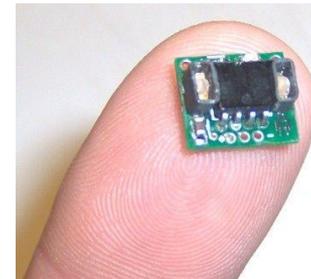
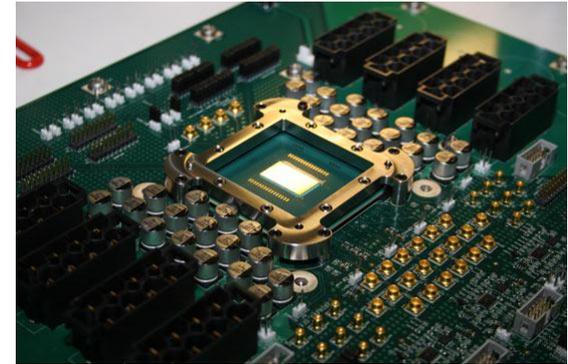
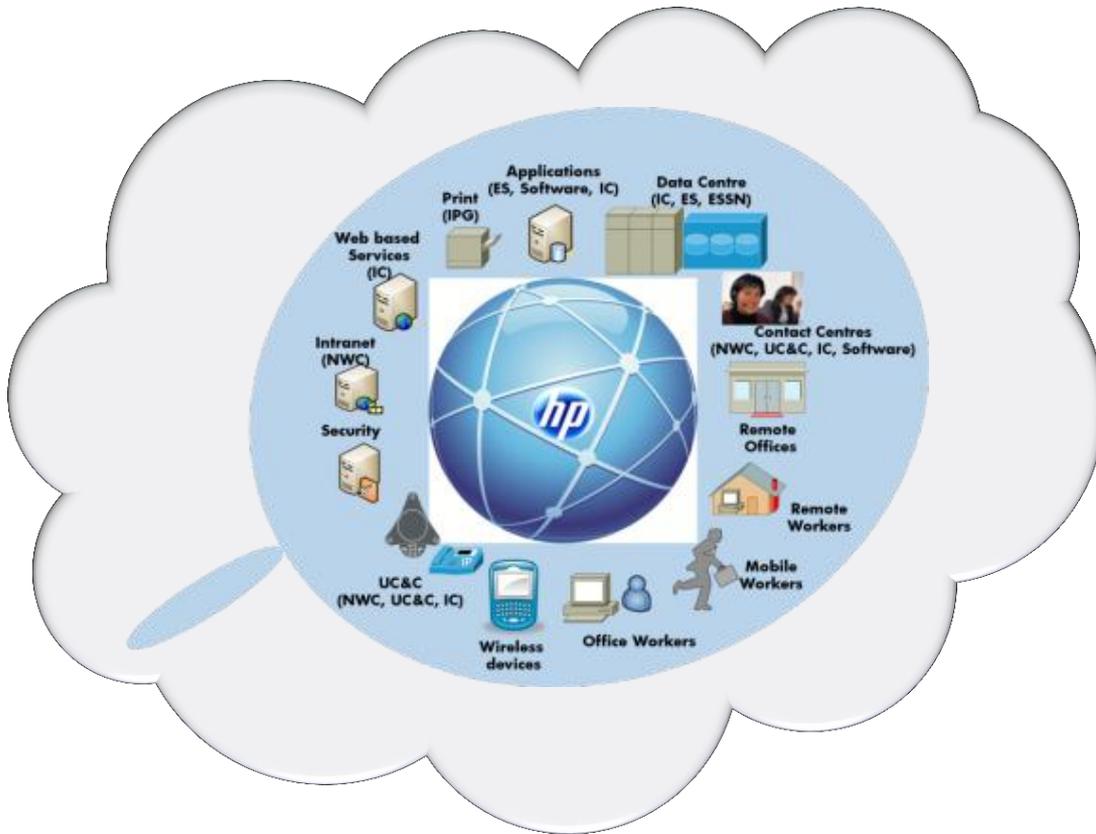
Picture from:  
Arrangements for Electric bass  
by Dave Grossman  
<http://www.jsbach.net/bass/>

# Cloud in the key of B#

In Cloud the key of B# = C<sup>3</sup>



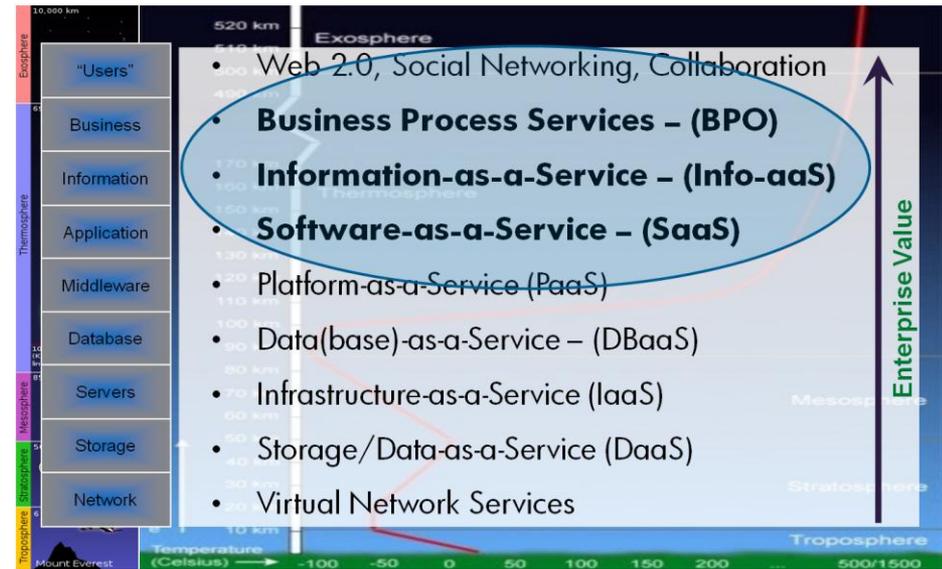
# The Cloud "Mash-up"



**THE INSTANT-ON  
ENTERPRISE IS HERE.**



# Cloud "Arrangements"



Infrastructure as a Service - IaaS - "Synthesizer"

Platform as a Service - PaaS - "Solo"

Software as a Service - SaaS - "Symphonic Band"



# Cloud “Variations”

## Community

Multiple Enterprises  
Shared interest  
Tight Security  
Controllable SLAs

## Public

Multiple Enterprises / Users  
Multiple Interests  
Could run anywhere  
Loose Security  
No SLAs

## Private

Single Enterprise  
Single/Multiple purpose  
Tightest Security  
Controllable SLAs

## Hybrid

Single to Multiple Enterprises  
Single to Multiple Users  
Security – “Chain is as strong as its weakest link”  
Some SLAs



# Cloud “Crescendo & Decrescendo”

  
SELF-SERVICE USER

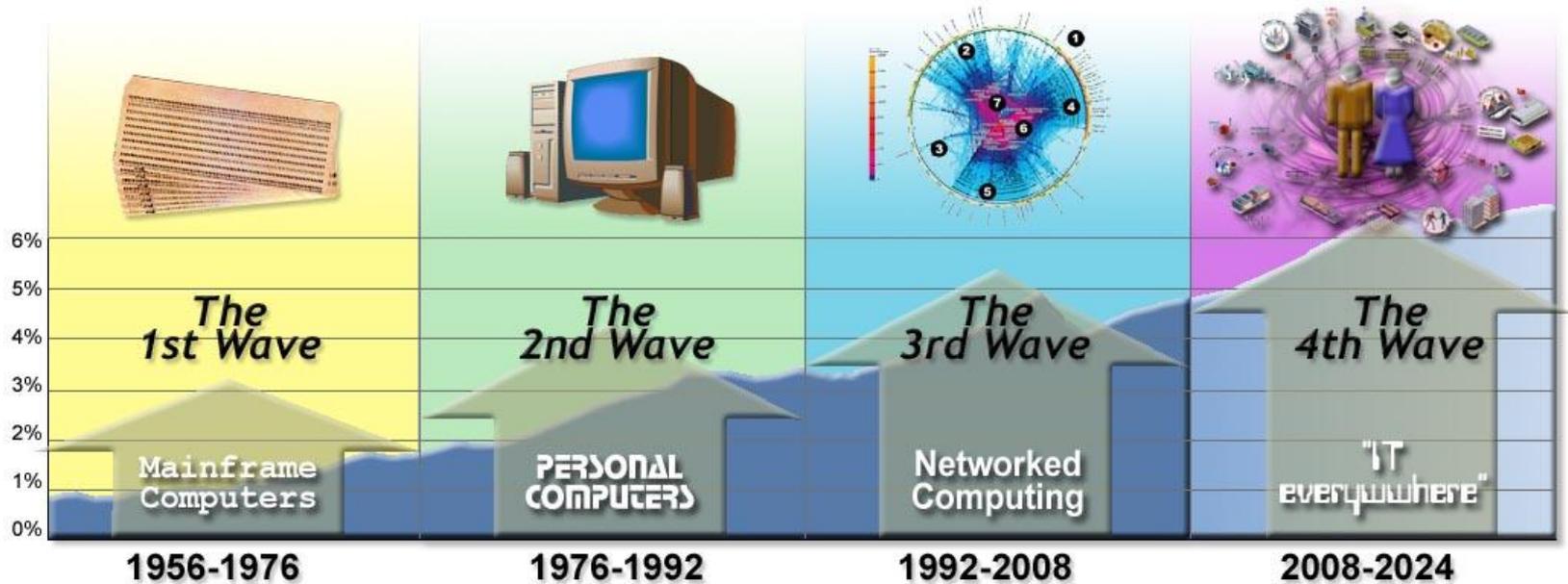
Hybrid delivery model can perform “Cloud-Bursting” and recovery based on orchestration configuration



Will your Data Rain when the Cloud Bursts?

Gartner Research  
24 September 2010 -  
ID:G00206825

# The roots of this “theme”



## The 4<sup>th</sup> Wave – IT Everywhere

Platform: Enterprise + Mobile/Consumer + “Cloud”

Threats: “Everywhere”

Security: Protect Data & Systems (everything private, everything secure)

## CHALLENGE

*The right mix of service delivery options (private cloud, public cloud, traditional data center) to optimize the access and use of new digital library*

## RESULTS

*A hybrid solution to meet the specific needs of Paul's media business*

*Private cloud delivered from HP's state-of-the art, secure data center coupled with HP-built on-premise IT infrastructure*

## SOLUTION COMPONENTS

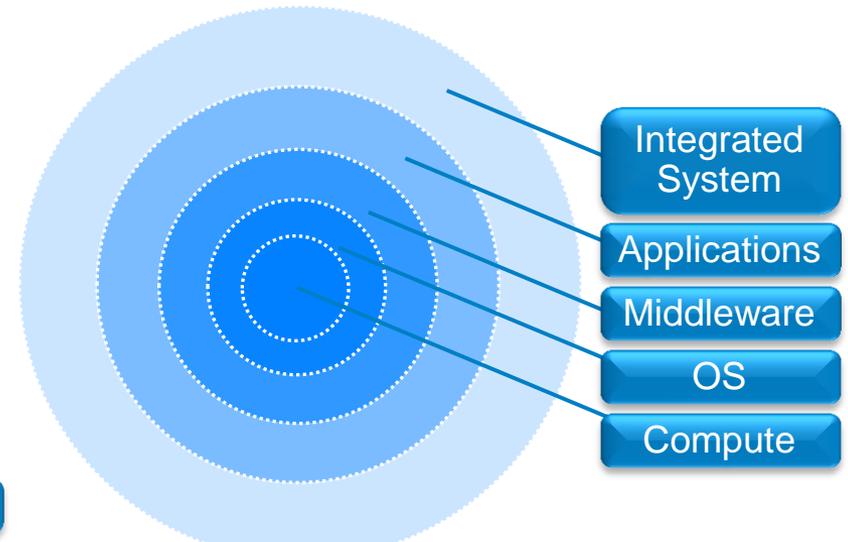
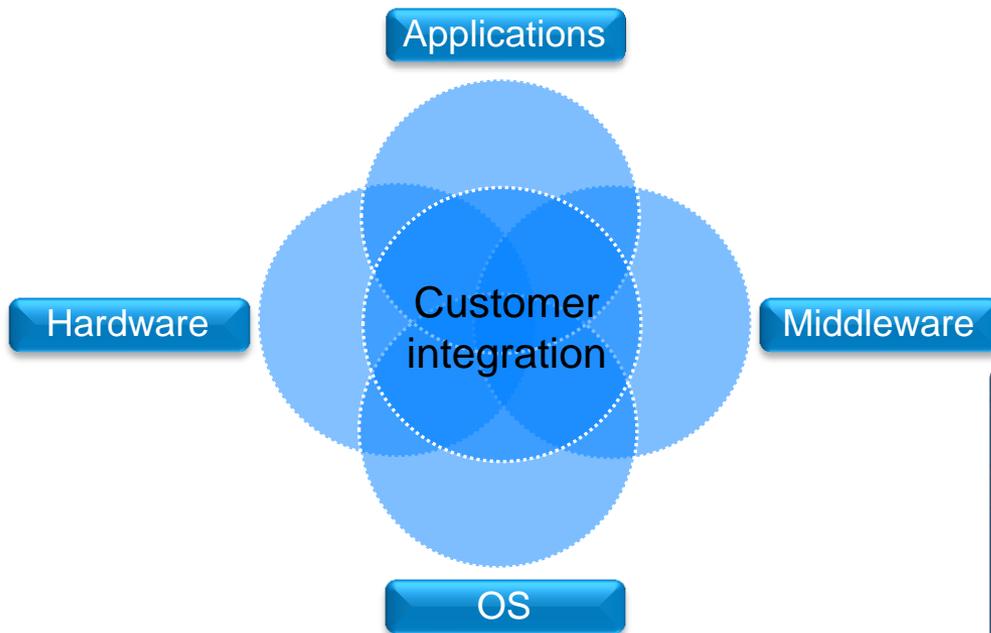
- *HP Hybrid Delivery solutions*
- *HP CloudSystem Matrix*
- *HP Flexible Compute Service*
- *HP Storage solutions*
- *HP Services*
- *HP Converged Infrastructure solutions*



# Composing for the Cloud

## CLOUD: Integrated design

## TRADITIONAL IT: Distributed design



# Point and Counterpoint

**Security**

Scalability

Auditing

Control

Governance

Data security & protection

**Performance**

Cost

Reliability

Service levels

**Availability**

Compliance

Security or related component is #1 concern/issue for most customers.



# Point and Counterpoint – Public Cloud



PT - We can lower the cost of compute....

CP - If your metered usage is 24 by 7 by 365 - You will pay for more

PT - We can provision servers quickly

CP - You must employ a "standard" configuration to provision quickly

PT - Our clerical staff can be more productive much faster

CP - What is your measurement of productivity?  
Are you paying incentives for through-put?



# Point and Counterpoint – Public Cloud



PT - We can reduce or even get rid of “fixed” assets...

CP – You are not likely to get a Public Cloud vendor to sign up for an SLA

PT – We will experience unlimited storage...

CP – Data Sprawl will become world-wide. Forget the concept of putting together a batch file for daily reporting from transactional data. Relational Query?

PT – Our Services can be available at any time

CP – In order to get true 24 by 7 by 365 you must replicate the data at 2X (or more) cost

# Point and Counterpoint – Public Cloud



PT – We can provision services (SOA) quickly

CP – How will integration to the back-end systems work? When will there be no “back-end” systems?

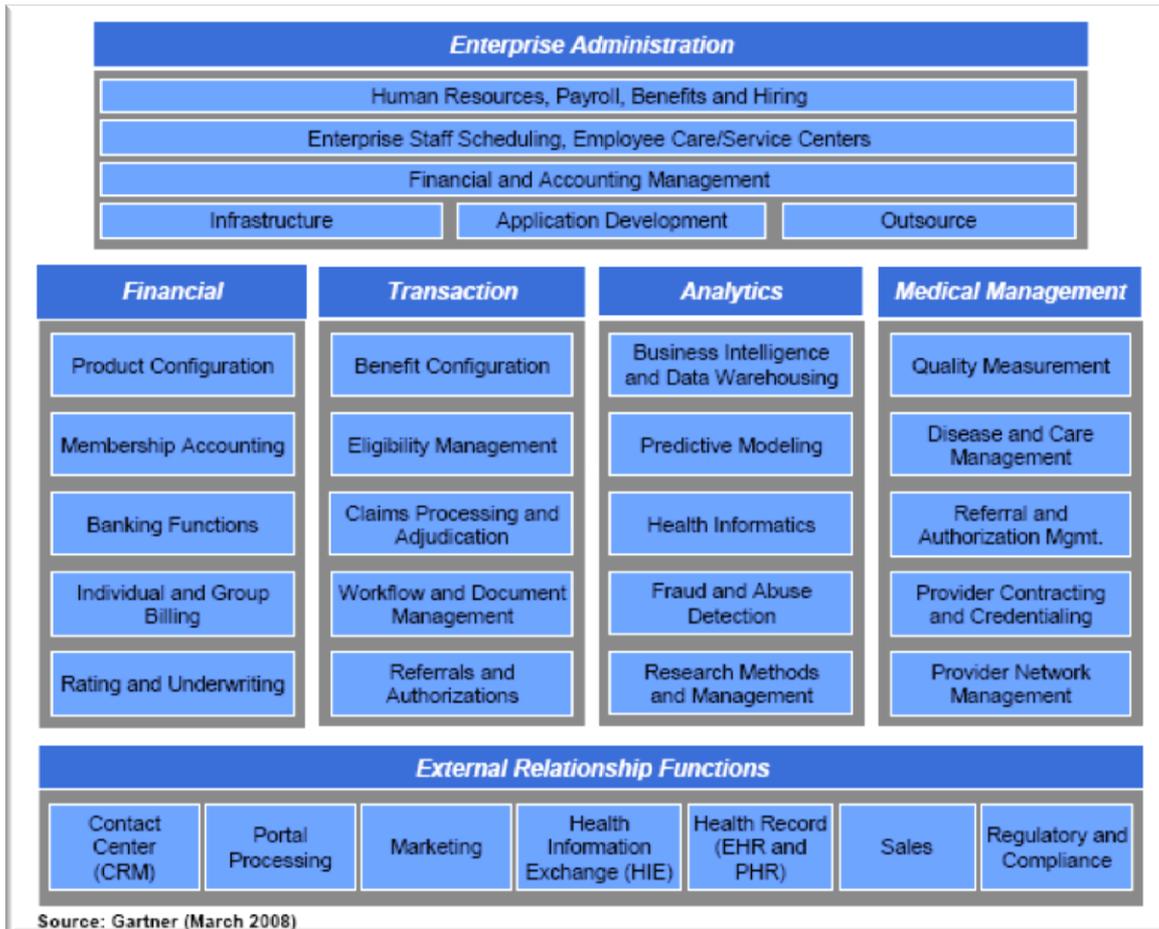
PT – We can take advantage of parallel processing

CP – True parallel processing requires new architectures

PT – We can move towards Green initiatives

CP – Will your Public Cloud Vendor sign up to the HIPAA regulations? Does your application have internal security?

# Healthcare Theory



Most applications require  
Private / Community  
Cloud enablement

Privacy laws dictate  
technology options

Both SORs and SOEs need  
decent response time to  
keep the user productive

Security and Privileges  
"should" be imbedded in  
the Application (last line  
of defense)

Multi-tenant capabilities a  
must for Server sharing

High I/O requirements  
should not "virtualize"  
the DBMS



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# “Symphonic Metamorphoses on themes of Enabling Technology”

## Keywords

Mash-up

Theme and Variations

Concert

B# = C-Cubed

Arrangements

- Synthesizer

- Solo

- Symphonic Band

Tight vs. Loose

Composing and Decomposing

Point and Counterpoint

Theory

Recordings vs. Live Concerts



Thank you

