3 Lessons
FROM BOTTLING CLOUDS
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@andywarfield
Why are enterprises falling behind state-of-the-art data center infrastructure?
Why isn’t this true of traditional enterprise IT?
Virtualize Everything
What’s the difference?
<table>
<thead>
<tr>
<th>ENTERPRISE</th>
<th>GOOGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIRTUALIZATION CRAZY</td>
<td></td>
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<tr>
<td>ENTERPRISE</td>
<td>GOOGLE</td>
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<tr>
<td>VIRTUALIZATION CRAZY</td>
<td>BESPOKE SYSTEMS</td>
</tr>
</tbody>
</table>
## HUGE COMPETITIVE ADVANTAGE

### STORAGE
- Google FS
- Amazon EBS/S3
- MS Azure Storage
- Facebook Haystack

### DATABASE
- Google Spanner
- Google BigTable
- Amazon Dynamo
- Twitter Manhattan

### COMPUTE
- Google MapReduce
- MS Dryad

### NETWORK
- Google B4
Why isn’t there a product with these benefits for enterprise?
This is Coho’s goal.

EFFICIENCY • SCALABILITY • INTEGRATION
3 Lessons
FROM BOTTLING CLOUDS
Commodity is King

Economics Demand Scale-out

You are a Precious Snowflake
Commodity is King

Economics Demand Scale-out

You are a Precious Snowflake
differentiate your hardware old way path to failure
Enterprises benefit from hardware innovation at large datacenter scale.
Physical appliance form factor has big enterprise value, BUT appliances must be based on commodity hardware and must evolve with commodity hardware
Commodity is King

Economics Demand Scale-out

You are a Precious Snowflake
Commodity is King

Economics Demand Scale-out

You are a Precious Snowflake
OLD WAY

Buy all the hardware you’ll ever need.
(FOR FIVE YEARS)
## FACTORS

<table>
<thead>
<tr>
<th>CPU</th>
<th>IOPS</th>
<th>Freq (Cores)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>E5-2620</td>
<td>127K</td>
<td>2 GHz (6)</td>
<td>US$406</td>
</tr>
<tr>
<td>E5-2640</td>
<td>153K (+20%)</td>
<td>2.5 GHz (6)</td>
<td>US$885</td>
</tr>
<tr>
<td>E5-2650v2</td>
<td>188K (+48%)</td>
<td>2.6 GHz (8)</td>
<td>US$1166</td>
</tr>
<tr>
<td>E5-2660v2</td>
<td>183K (+44%)</td>
<td>2.2 GHz (10)</td>
<td>US$1389</td>
</tr>
</tbody>
</table>
RESULT

Hyperconvergence is a really bad idea.
FACTORS

+ MOORE’S LAW
LESSON

Demand systems that let you take advantage of newer, cheaper hardware as it becomes available.
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3 FACTORS

APP  DATA  YOUR TEAM UNDERSTANDS YOUR BUSINESS
Systems must respond to workloads and adapt performance accordingly.
Commodity is King

Economics Demand Scale-out

You are a Precious Snowflake
Performance Balanced MicroArrays
SDN Switch Balanced

COHO Data

Network Interfaces

Intel Processors

Storage Devices
SDN INTEGRATION FOR COMPLETELY TRANSPARENT HORIZONTAL SCALE
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