DATA CENTER WORLD Orlando Conference

Data Center: In House – Outsource – Optimize Options

Presented By: Mark Evanko – Principal Engineer
BRUNS-PAK
999 New Durham Road
Edison, NJ 08817
www.bruns-pak.com

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Data Center: In House – Outsource – Optimize Options

The data center presentation provides an overview of the recent trends (2013/2014 and beyond) of the overall considerations associated with maximizing a short/long term data center solution. Should the data center function remain "in house"? Should the data center function be "outsourced" (co-location/cloud)? How valuable is my data center and what guarantees do I need for security? How does the private sector, university, non-profit, medical, and/or government agency optimize the overall data center solution? What are the trends? Learn the contributing Capex vs. Opex thought processes.

Agenda

I. *Defining the Mix of "Elements" (16) Considered in the Data Center Solution*

II. *Critical Considerations to be Evaluated when Assessing Whether to Keep a Data Center Operation "In House" or to "Outsource"*

III. *How to Optimize the Overall Data Center Solution Recommendation*

IV. *What are Recent "Trends" in the Data Center Industry for Solutions?*

V. *Why is Data Center Security Such a Large Consideration for Location of Processing?*

VI. *Closing – Summary Recap*

Part I

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

The BRUNS-PAK Hybrid "2014 Transformation" Efficient Data Center Elements

ENERGY EFFICIENCY (2)

COMPUTER HARDWARE (3)

FACILITY INFRASTRUCTURE (1)

CLOUD (4) Internal/ External

LEGAL REPERCUSSIONS (16)

GOVERNMENT/CORPORATE/ UNIVERSITY/NON-PROFIT (15)

DISASTER RECOVERY (5)

CO-LOCATION (6)

CONTAINERS (14)

CAPEX vs. LEASE/OPEX (13)

MIGRATION/ RELOCATION (7)

PERSONNEL (12)

COMPUTER SOFTWARE (8)

SERVICE LEVEL AGREEMENTS (11)

COMMUNICATIONS/ NETWORK (10)

MODULARITY/SCALABILITY /RELIABILITY (9)

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

1) **Facility Infrastructure**
   - ***A. Architectural***
   - ***B. Civil***
   - ***C. Electrical***
   - ***D. Fire Protection (EPO Code Change) – Update NEC/NFPA vs. Factory Mutual***
   - ***E. Mechanical – CFD Models***
   - ***F. Security***
   - ***G. Site***
   - ***H. Structural***
   - ***I. Geographic Regional Considerations… i.e. southwest hurricanes, west earthquakes, etc.***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

2) Energy Efficiency

- ***A. ASHRAE 9.9 – Higher Inlet Temperatures***
- ***B. Why pay for electrical consumption for mechanical cooling?***
- ***C. CFD Models***
- ***D. Heat Wheel***
- ***E. 400v AC/DC***
- ***F. DCIM***
- ***G. Virtualization of Servers***
- ***H. Higher efficiency computer equipment***
- ***I. March 14, 2014 – Federal data center efficiency legislation passes US House of Representatives***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

J. ***LEED – New data center guidelines***

- ✓ **Written to save "dollars" and be more green**
- ✓ **Office of Management and Budget to create a strategy**
- ✓ **DOE and EPA to study server and data center efficiency trends**
- ✓ **New "data center energy practitioner program"**
- ✓ **New "metrics"**
- ✓ **Data center LEED guidelines - New**

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

3) Computer Hardware

- ***A. Higher Efficiency***
- ***B. "Flash" storage announcements***
- ***C. Virtualization***
- ***D. High performance computing impacts – All critical?***
- ***E. Scalability/Modularity/Flexibility***
- ***F. Water cooled to the chiller***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

4) Cloud

- ***A. Managed services***
- ***B. Internal vs. external***
- ***C. Migration to the cloud***
- ***D. Impact of returns***
- ***E. Moves/adds/changes***
- ***F. Trouble shooting***
- ***G. True "partner" of equal financial stability – San Diego 2013 cloud provider "30 day notice to vacate"***
- ***H. Downtime: Who Pays?***
- ***I. Security Breach: Who Pays?***
- ***J. Terms and conditions (Legal Beagles!!!) 2014+***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

- ***K.*** ***Senator Menendez – New Jersey – Sponsoring new legislation 2014 - fines***
- ***L.*** ***Speed to delivery of applications***
- ***M.*** ***"Candidacy" of applications***
- ***N.*** ***The 2014 / 2015 / 2016 contract language for cloud contracts***
- ***O.*** ***Critical vs. non-critical data***
- ***P.*** ***Moves/adds/changes***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

5) Disaster Recovery

- ***A. Hot or cold***
- ***B. Recovery time***
- ***C. Internal disaster recovery data centers vs. external "leased" disaster recovery centers***
- ***D. Lease terms and conditions for availability***
- ***E. Government regulations for uptime – banking/healthcare/etc.***
- ***F. Active testing***
- ***G. Guarantee of "space" when needed?***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

6) Co-Location

- ***A. Leased data center constructed space***
- ***B. Capex schedule of delivery minimized***
- ***C. ROI – see total cost of ownership – 3+?***
- ***D. Other tenants? – Impact of security***
- ***E. Downtime: Who pays?***
- ***F. Security Breach: Who pays?***
- ***G. Terms and conditions (Legal Beagles 2014!!!)***
- ***H. Senator Menendez – New Jersey sponsoring legislation 2014 and beyond***
- ***I. Financial strength of service providers – see Cushman Wakefield survey of "economics" 2014 report.***
- ***J. Moves/add/changes***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

7) Migration / Relocation

- ***A. Move existing or buy/lease new?***
- ***B. Asset swap outs***
- ***C. General hardware life cycle ± 3-4 years?***
- ***D. Maximize uptime***
- ***E. Multiple phases***
- ***F. Consolidation strategies***
- ***G. Physical cost vs. planning costs***
- ***H. Impacts of the network***
- ***I. Move it? – Plan to migrate back? – Resume update***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

8) Computer Software

- ***A.*** ***Large scale corporate "procurement" effort to leverage one (1) massive licensing agreement vs. "two hundred" division licenses***
- ***B.*** ***Single point of failure considerations vs. mirroring***
- ***C.*** ***Impacts of hardware platforms***
- ***D.*** ***Downtime***
- ***E.*** ***Impact of licenses at cloud and/or co-location***
- ***F.*** ***Cost changes 2014 / 2015 / 2016***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

9) Modularity / Scalability / Reliability

A. ***Optimize***

- ✓ **Computer hardware**
- ✓ **Computer software**
- ✓ **Telecommunication (network)**
- ✓ **Facilities**
- ✓ **Service level agreements**

Scale with growth!

B. ***Defray CAPEX dollars until needed across the board***

C. ***Scale without interruption***

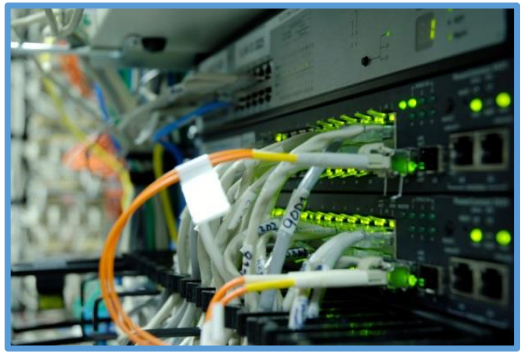
D. ***Reliability past/present/future***

E. ***In house vs. outsource***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

10) Communications / Network

- ***A. Redundant / isolated paths?***
- ***B. Multiple carriers***
- ***C. Data breach? Who pays? Significant dominant focus 2014 / 2015 / 2016***
- ***D. Data security? Who is responsible?***
- ***E. The power of the cloud – iPhone® 5S/6/6Plus – WOW!!***
- ***F. Impact of network loss***
- ***G. Who manages the network?***



Defining the Mix of "Elements" (16) Considered in the Data Center Solution

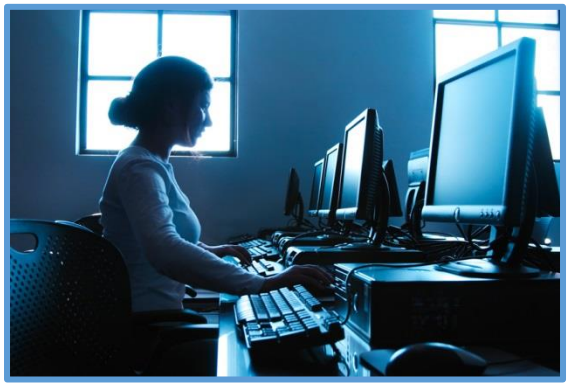
11) Service Level Agreements

- ***A. Internal vs. external (client) based***
- ***B. Government imposed guidelines/performance (i.e. HIPPA, etc.)***
- ***C. Co-Location / Cloud – 2014 transformation – fine print – who pays? – how much? – damages (Legal Beagles 2014!!)***
- ***D. What does 99.999 availability mean to me when "I go down?"***
- ***E. Moves/adds/changes without interruption!***
- ***F. New "fines/penalties" by external agencies being processed 2014 / 2015 / 2016***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

12) Personnel

- ***A. Employee vs. contract personnel***
- ***B. Mr. Snowden contract person? Who is liable?***
- ***C. Client worldwide – "as the world turns" personnel solution – United States/Europe/Singapore – payback 18 months***
- ***D. Efficiency metrics***
- ***E. Data Breaches?***
- ***F. Banks recent statements – limited liability***



Defining the Mix of "Elements" (16) Considered in the Data Center Solution

13) CAPEX vs. OPEX

- **A.** ***CAPEX – Capital dollars spent to build/deploy data center across (16) elements***
- **B.** ***OPEX – Operating dollar "expense" to financial statements – very attractive***
- **C.** ***New trend of internal "OPEX" data center solution 2014 / 2015 / 2016***
- **D.** ***Cloud/co-location OPEX?***
- **E.** ***2008 - 2014 economics crises worldwide leads to bottom line***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

14) Containers

- ***A. Portable***
- ***B. Speed of delivery?***
- ***C. Local zoning regulations regarding deployment of permanent structure?***
- ***D. Pre-fabricated structure compliance with local building codes / approvals***
- ***E. Work flow***
- ***F. Saves building addition***
- ***G. Government exempt***
- ***H. ADA compliance***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

15) Government/Corporate/University/Non-Profit

- **A.** ***The new "data center energy efficiency" (March 2014) and Senator Menendez Initiative***
- **B.** ***The cost and liability of data infringement***
- **C.** ***Worldwide government are experiencing the impacts of data processing issues***
- **D.** ***Currently US regulations exist for banking, healthcare, financial etc.***
- **E.** ***The board or directors and trustee (university) responsibility and liability***
- **F.** ***Insurance***

Defining the Mix of "Elements" (16) Considered in the Data Center Solution

16) Legal Repercussions

- ***A. The most dominant theme of 2014 / 2015 / 2016 data center optimization impacting in house vs. outsource***
- ***B. Government fines***
- ***C. Stockholder lawsuits***
- ***D. Individual lawsuits***
- ***E. Fiduciary responsibility***
- ***F. "Non-disclosed" trends***

Part II

Critical Considerations to be Evaluated when Assessing Whether to Keep a Data Center Operation "In House" or to "Outsource"

Critical Considerations to be Evaluated when Assessing Whether to Keep a Data Center Operation "In House" or to "Outsource"

1) Type of data processed
2) Type of applications utilized
3) Type of computer platforms utilized across the enterprise
4) Uptime requirements both short and long term
5) Impacts to the enterprise of:
   - A. *Downtime*
   - B. *Data security breach*
   - C. *SLA's*
   - D. *CAPEX vs. OPEX mission*

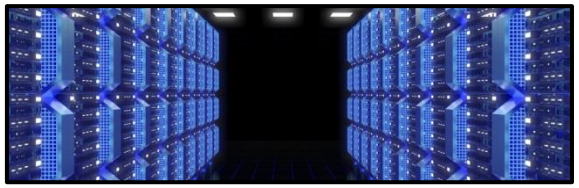
6) Impact of pending legal legislations – if it changes – can you move back? Force existing contracts to change with liabilities?

Part III

How to Optimize the Overall Data Center Solution Recommendation

How to Optimize the Overall Data Center Solution Recommendation

1) **The BRUNS-PAK belief of the 2014 / 2015 / 2016 sixteen (16) element data center "hybrid solution"**
2) **One "size" does not fit all!**
3) **The major components of hybrid:**



- ***A. Physical internal data center***
- ***B. Cloud – external***
- ***C. Cloud – internal***
- ***D. Co-location***
- ***E. Network***
- ***F. Disaster Recovery***
- ***G. Container***
- ***H. Internal finance – OPEX vs. CAPEX***
- ***I. Legal liability***
  - ✓ ***Breach***
  - ✓ ***Downtime***
- ***J. Application and hardware "candidacy"***
- ***K. Flexibility to change based on current legislation!! (Unless new opportunities are sought)***

Part IV

What are the Recent "Trends" in the Data Center Industry for Solutions

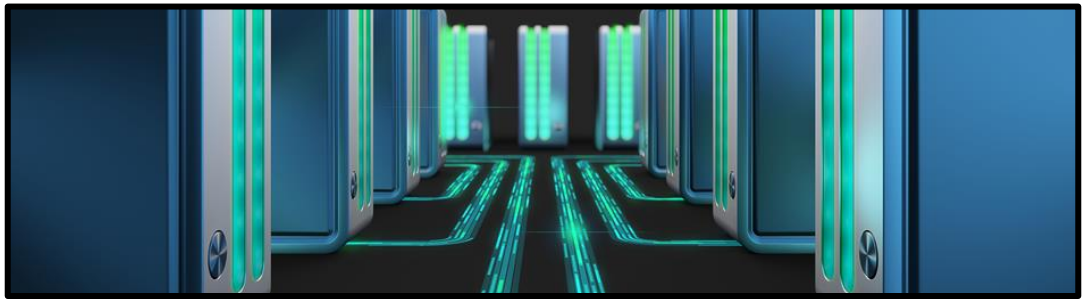
What are the Recent "Trends" in the Data Center Industry for Solutions

1) **Outsource – no thinking required**
2) **Co-location vs. cloud**
3) **Critical data/platforms/applications staying "home"**
4) **Legal language/penalties/liabilities in new co-location and cloud contracts for:**
   - ***A. Downtime***
   - ***B. Data breaches***
   - ***C. Financial guarantees of 3rd party providers***
   - ***D. Accommodation of future "unknown" legislation***
5) **Internal data center cloud and co-location solutions with OPEX cost models**

What are the Recent "Trends" in the Data Center Industry for Solutions

6) Tremendous focus on total cost of ownership for all sixteen (16) elements prior to decision

7) TCO considerations with risk



Part V

Why is Data Center Security Such a Large Consideration for Location of Processing?

Why is Data Center Security Such a Large Consideration for Location of Processing

1) **Liability, Liability, Liability**
2) **If corporate, what are the board of directors responsibility to the stockholders?**
3) **If academic/university, what are the trustees responsibility?**
4) **If non-profit, what are the board members responsibility?**
5) **If government, what are the administration members responsibility?**
6) **Hospital / healthcare:**
   - ***A. Patient care records?***

Why is Data Center Security Such a Large Consideration for Location of Processing

7) **Recent sample examples:**

- ✓ *Home Depot*
- ✓ *Target – update from spring 2014 - CIO, President, and Board of Directors removed.*
- ✓ *JP Morgan Chase*
- ✓ *Dairy Queen*
- ✓ *Fire Department (specific)*
- ✓ *US Government and Wiki leak – national security*
- ✓ *The Cyber attack*
- ✓ *Numerous other financial institutions*
- ✓ *Apple / iPhone*

Why is Data Center Security Such a Large Consideration for Location of Processing

8) **Reported by cyber security breach data. The attacks were up 20.5% last year and expected to significantly grow in 2015 / 2016 / 2017 +++ - Identity Theft Resource Center**

9) **Confidential examples:**

   A. ***Client co-lo***

   B. ***After seminar disclosed "in confidence" lost $56,000,000 attack. Non-disclosed***

Part VI

Closing – Summary Recap

Summary

2014

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*Dilbert

Thank You

Mark Evanko – Principal
BRUNS-PAK
999 New Durham Road
Edison, NJ 08817
Ph: 732-248-4455
www.bruns-pak.com