DATA CENTER/CLOUD/COLO "HYBRID" SOLUTIONS

Facilities – IT – LV – Cloud – Colo

Consulting/Design/Engineering/Build Services

BRUNS-PAK Services

2024

Introduction

- ***Paul Evanko:*** *SVP BD & Strategic Alliances – BRUNS-PAK*

Agenda

I. Objective
II. BRUNS-PAK Overview
III. BRUNS-PAK Services
IV. BRUNS-PAK Partnerships
V. Market Positioning
VI. Competitive Positioning & Differentiation
VII. Customer Success Stories
VIII. Future Plans & Roadmap
IX. Closing
X. General Discussion

I. Objective

- At the conclusion of this presentation, you will understand:
  - BRUNS-PAK's core competencies and project methodology for facilities/IT/LV consulting, design and construction development
  - Data Center/IT/LV services that differentiate BRUNS-PAK from others

I. BRUNS-PAK

Uniquely Positioned Between Converging Technological Requirements

The Established World of Facility Management/Classic A/E Design

The Established World of Information Technology

BRUNS-PAK
Technology
Integration

II. Overview of BRUNS-PAK

Experience:

1. More than 45 years designing, engineering, constructing and commissioning advanced computing and technology facilities.
2. Participated in thousands of data center projects in Public Sector, Hospital, Healthcare, Technology, Financial Services, Higher Education, Retail, Banking, IT Consulting, Pharmaceutical, Industrial, Insurance, Government, and Publishing Industries with a significant repeat customer base.
3. Full-service staff of licensed civil, electrical, mechanical engineers, and architects as well as construction project managers, systems specialists, CADD and REVIT technicians, commissioning agents, CFD/IT architects, IT consultants, and other skilled professionals.
4. Program methodology and process for delivery of data center services that integrate short and long term IT plans with facility infrastructure. Recommended by Gartner/IDC/Forrester.
5. We provide national based discussions regarding "trends" in the data center/cloud/colo industry and BRUNS-PAK's experience in developing "ultra-reliable" data/telecommunication centers at well established conferences such as:

AFCOM	*Server Blade Summit*	*NFM&T*	*APPA/ERAPPA*	*IBM Data Centers Conference*	*Honeywell Users Group*
7X24	*DataCenterDynamics*	*Uptime Institute*	*IBM IPR Conference*	*Critical Facilities Summit*	*EDUCAUSE*

6. We have extensive experience in developing phased expansion of corporate, healthcare, public sector, and higher education data center facilities, designing and building new data center facilities, and migrating clients to the cloud and colo's.

III. BRUNS-PAK Services – Facility Infrastructure

Consulting Services

Thorough and comprehensive, resulting in a plan that provides options and technical alternatives to meet your timeframes, philosophies, short-term and long-term strategic objectives, as well as budgetary guidelines.

- *Data Center "Hybrid" Assessments*
- *Site Evaluation, Selection, & Planning*
- *Network Analysis/Wi-Fi Analysis*
- *Reliability Studies*
- *Single Point of Failure Analysis*
- *Data Center Facility Audits*
- *DR Facility Requirement Studies*
- *Site Assessment Evaluations*
- *LEED Certification Analysis*
- *Colo/Cloud Analysis*
- *Container/Pod Studies*
- *Relocation Evaluations*
- *Merger/Consolidation Studies*
- *Space Planning*
- *Virtualization Integration*
- *Facility Evaluations*
- *Computer Equipment Planning*
- *Requirements Analysis*
- *Preliminary Program Studies*
- *Thermal Air Flow Analysis*
- *Energy Efficiency Audits*
- *Total Cost of Ownership Studies*
- *IT Business Impact Analysis*
- *IT Data Center Strategic Planning*

Design/Engineering Services

Drawings and specifications that reflect **creative, state-of-the-art design solutions.**

- *Architectural Design*
- *Site/Civil Engineering*
- *Communications Engineering*
- *Design for Sustainability*
- *3-D Revit Modeling*
- *AV*
- *Electrical Engineering*
- *Mechanical/HVAC Engineering*
- *Fire Protection Engineering*
- *Structural Engineering*
- *Voice*
- *Raised Floor Engineering*
- *Security Design*
- *Voice and Data Cable*
- *BMS/DCIM Modeling*
- *Network Design*
- *Wireless*
- *Communications*
- *Electronic Wire & Cable*
- *Electrical Wire & Cable*
- *Mass Notification Systems*

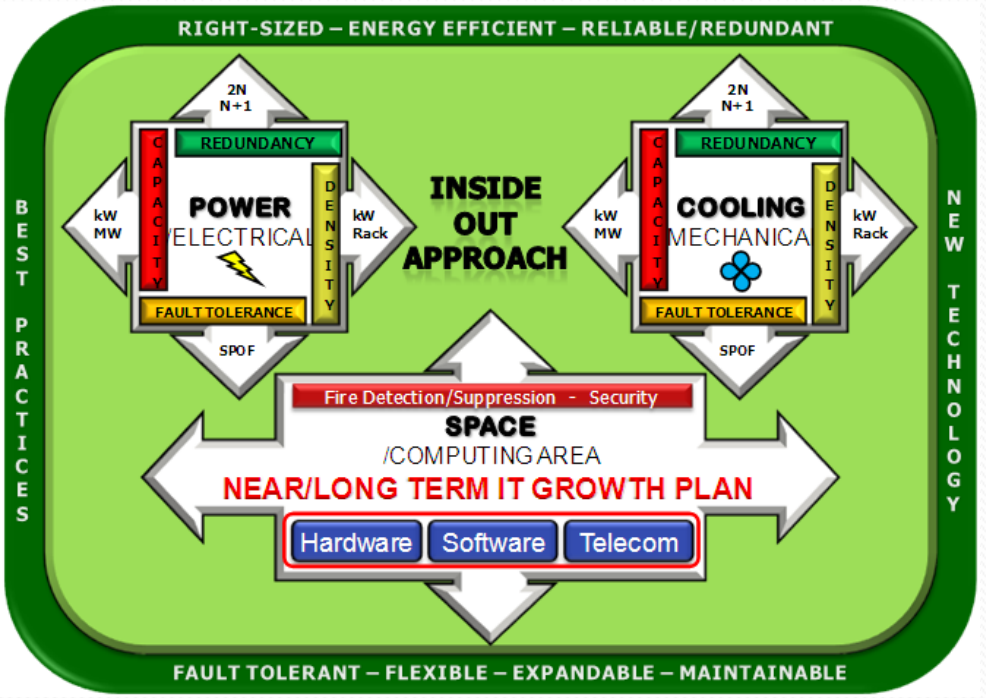
Construction/Commissioning Services

A fully integrated approach to the creation of technical facilities that gives you a **single source of responsibility from start to finish**. This unique methodology eliminates traditional construction delays, enhances responsiveness to design modifications, and guarantees necessary technical expertise - throughout the project. We also offer options for corporations looking to reduce overhead by **outsourcing construction and maintenance responsibilities**.

- *Construction Management*
- *Construction Administration*
- *General Contracting*
- *Commissioning*
- *Project Management*
- *Project Planning & Scheduling*
- *Turnkey Planning, Implementation*
- *BIM Modeling*
- *Financing*

III. Elements of the Facility We Address

- Existing Conditions
- New Requirements
- Architectural
- Electrical
- Mechanical
- Fire Protection
- Security
- Building Management and Control
- LV Cable
- AV
- Wireless
- Network
- "Smart" Technology
- Site/Civil/Structural



III. Key Issues Facility Infrastructure

- **Impact of the client's technology plan on the facility requirements – Blades/HPC/AI and Beyond.**
- **Impact of "technology trends" – Edge - Colocation – Cloud – Container – PODS – Network/WiFi (B400)**
- **Day 1 Capacity/Density Requirements**
- **Day 1 Reliability Requirements**
- **Future Growth**
  - ✓ *Capacity/Density*
  - ✓ *Reliability*
  - ✓ *Modular/Scalable/Flexible Options*
- **Optimize Equipment Floor Plan – Validate with CFD**
- **Energy Efficiency – LEED/Green/PUE Initiatives**
- **Construction Budgets & Schedules**
- **Construction Site Location**

III. IT / Security / Communications / AV Services

A successful, intelligent operation system empowers efficiency and user productivity. Our security and technology team combines technical know-how with essential, detailed knowledge of current and emerging security, IT, audiovisual, communications, multimedia, and intelligent building management technologies to ensure your operation systems are seamlessly effective.

Identifying needs

Increasingly, asset owners and operators seek out flexible, integrated technology solutions that are fit for immediate purpose and future use. Our Technology team of Registered Communication Distribution Designers (RCDD), Physical Security Professionals (PSP) and Professional Engineers (P.E.) bring a deep understanding of network architecture design, technology platforms and processes to provide ISO-based designs that are tailored to the best possible solution for your needs.

Services

Project Experience
- Optical Fiber Technology, including fault tolerant designs
- Ethernet, SONET, ATM, & Infiniband Network Designs
- WAN designs including Campus Outside Plant
- Microwave & IR Telecommunications Technology designs
- ANSI/TIA Structured Wiring Systems - inside and outside plant
- Data Center / Computer Room Designs including Network Appliances

Operations Centers
- Inside & Outside Plant (ISP & OSP) Communications

Infrastructure Design
- RF Radio Syste
- CCTV / CATV Distribution
- Indoor/Outdoor Wireless WiFi
- Passive Optical Networks
- DAS Systems
- PA Systems
- Mass Notifications Systems

Technology - IT and Communications Systems
- Structured cabling solutions, including optical and copper
- Transmission infrastructure and data networks - local area, metropolitan area and wide area networks including SDH/PDH provisions
- Voice and data telephone systems – IP telephony, Voice over IP (VoIP) and traditional PABX
- Wireless solutions – WLAN, DECT, DAS GSM, WiFi, line of site, WiMax through to fully meshed networks
- IT accommodations – data centers, server rooms, co-location facilities; spatial sizing; equipment layouts; power and cooling requirements
- Active IT equipment – desktop PCs through to enterprise servers and storage
- Radio – TETRA, GSM and site wide communications
- 3D Indoor wireless network modeling of IT, DAS and RF networks utilizing iBwave modeling software

III. IT / Security / Communications / AV Services

Audio visual and multimedia systems

- CATV, IPTV and distributed media; satellite and terrestrial TV distribution systems
- Conferencing and presentation facilities including video conferencing - telepresence and lecture theatres; background music and DJ systems
- Dynamic signage, customer information and media systems
- Hotel systems including room booking systems, guest internet services and property management systems
- Smart buildings; interactive learning and working

Intelligent building management

- Sensors, field hardware, software, virtual automation and demand management
- Network infrastructure to support Scada, Modbus and PLC networks
- Heating, boiler plant, ventilation and air conditioning control; utility metering
- Lighting control
- Intelligent graphical command and control software and systems with all security, communications, life safety, fire building and energy management systems fully integrated on appropriate infrastructure

Benefits

We work with you through the entire project life cycle, from feasibility through to design, system specification, project management, commissioning and beyond. We deliver value through:

- Financial savings through an efficient design process
- Safer and more productive working environments
- Easy to operate buildings with converged control over the entire estate
- Real time information that improves the decision-making processes and intelligent interaction between systems

What to expect

BRUNS-PAK strives to help drive down costs of ownership and drive up technology innovation through the knowledge and expertise of our Technology Consulting team. With an eye on your architectural vision, we'll blend solutions discretely into the body of the building, creating flexible spaces that are safe, secure and productive. We recommend the most suitable security and technology options to help achieve your business objectives, and provide sustainable, integrated design solutions that fit your vision.

III. Low Voltage / Network / AV / Wireless Overview

System Design Services - Overview

Communication Cabling Infrastructure

- Voice – Data – Video – Security Cabling systems
- Architectural packages and specifications

Network Design

- Technologies recommendations
- Topology and logical network design
- Architectural Planning
- Network architectural packages

Wireless Design

- Capacity planning
- Business analytics
- Service optimization and prioritization
- Exterior Wireless Mesh Systems
- Security and compliance
- High availability, mission critical design
- Interior WiFi Design and Predictive Analysis
- Exterior point-to-point Systems

Audio Visual Systems

- Mass Notification Systems
- Specialty AV Systems
- Classroom AV Systems
- Theatric & Key-Note AV Systems

Physical Security Systems

- Intrusion Detection Systems
- Video Surveillance Systems
- Access Control Systems
- Visitor Management Systems

Assessment Services - Overview

Network Design

- Infrastructure analysis
- VLAN planning
- Security & compliance
- Traffic & capacity demand planning
- Routing & switching plan
- Service optimization and prioritization

Cyber Security Services

- Information security policy and procedure assessment and update
- Business continuity and disaster recovery assessment and program development
- Incident response plan development
- Security operations assessment and optimization
- Risk assessments
- Regulatory and compliance assessments
- Security maturity assessment
- Data visibility and governance

Physical Security

- Comprehensive Analysis of asset protection as related to physical security systems.
- Assess existing technologies for practicalities of upgrading and implementing new technologies.

III. Low Voltage / Network / AV / Wireless Overview

Installation Services - Overview

- Installation and support of Mission-Critical IT Systems – Copper and Fiber
- Vertical/Horizontal Campus Cabling – Copper and Fiber
- Outdoor Cable Plant Cabling – Copper and Fiber
- Data Center Network Cabling Services
- Network Integration
- Wireless Access Point Surveys, Active & Predictive Modeling, Installation
- Network security cabling and camera placement
- Audio Visual Installation Services
- Security System Installation
- Sound Masking / Mass Notification Systems
- Multi-Site Deployment and Roll-Out Services
- Large Staff of Registered Communications Distribution Designers (RCDDs)
- Data Center Specialists

IV. Strategic Alliances / Partnerships

ANIXTER
d'agostino & ASSOCIATES Technology – Security – Audio Visual
GLOBAL TECHNOLOGY SOLUTIONS GROUP
HITACHI
GHD digital
World Wide Technology
ComNet COMMUNICATIONS
IES Communications
kyndryl
Deloitte
(Collaborations)
DELL
DUKE ENERGY
verizon business
CONVERGE TECHNOLOGY SOLUTIONS
SIEMENS
IBM
CISCO
accenture
CDW
LIGHTHOUSE COMPUTER SERVICES
cbts
SINE NOMINE ASSOCIATES
SIRIUS COMPUTER SOLUTIONS
EMC²
where information lives
dataSPAN
data storage solutions
WINBOURNE CONSULTING, LLC
SIEMON
AECOM

V. BRUNS-PAK Market Positioning

"Integrators of Facilities and IT"

Data Center/Cloud/Colo Solutions That Optimize These Facilities/IT Infrastructure Elements/Options and Corresponding Costs

- ✓ **Consolidate/Renovate/Retrofit Existing (CAPEX)**
- ✓ **Build New (CAPEX)**
- ✓ **Containers/Pods (CAPEX)**
- ✓ **Build New Leaseback (OPEX)**
- ✓ **Co-Location (OPEX)**
- ✓ **Cloud (OPEX)**
- ✓ **Network/WiFi**
- ✓ **IT Business Impact Analysis**
- ✓ **Migration/Relocation**
- ✓ **Hybrid**

The New 2023/2024 and Beyond Data Center Solution

The proven BRUNS-PAK's "Three (3) Step" Process:

- ***PHASE I - Consulting/Options-Budgets***
- ***PHASE II - Design/Plan***
- ***PHASE III - Build/Deploy***

A data center vendor neutral/solution neutral approach with options/alternatives/cost estimates and schedules. (CAPEX vs. OPEX)

V. BRUNS-PAK

Mission Statement:

The objective of the BRUNS-PAK mission is to provide clients with a comprehensive, state of the art, well managed, modular/scalable, cost effective data center/cloud/colo "hybrid" solution that optimizes:

1. *Facility Infrastructure*
2. *Energy Efficiency / ESG*
3. *Computer Hardware / HPC / AI*
4. *Cloud Internal/External*
5. *Disaster Recovery*
6. *Co-Location*
7. *Migration/Relocation*
8. *Computer Software*
9. *Modularity/Scalability/Reliability*
10. *Communications/Network*
11. *Service Level Agreements*
12. *Personnel*
13. *CAPEX vs. Lease/OPEX*
14. *Containers*
15. *Government/Corporate/University/Non-Profit*
16. *Legal Repercussions*
17. *Cybersecurity*
18. *Compliance*
19. *Edge Computing*

V. Elements of a Successful Data Center/Cloud/Colo "Hybrid" Project

The Efficient Hybrid "2024 Transformation" - Data Center Elements

FACILITY INFRASTRUCTURE (1)

ENERGY EFFICIENC/ESG (2)

COMPUTER HARDWARE/HPC/AI (3)

EDGE COMPUTING (19)

COMPLIANCE (18)

CYBERSECURITY (17)

LEGAL REPERCUSSIONS (16)

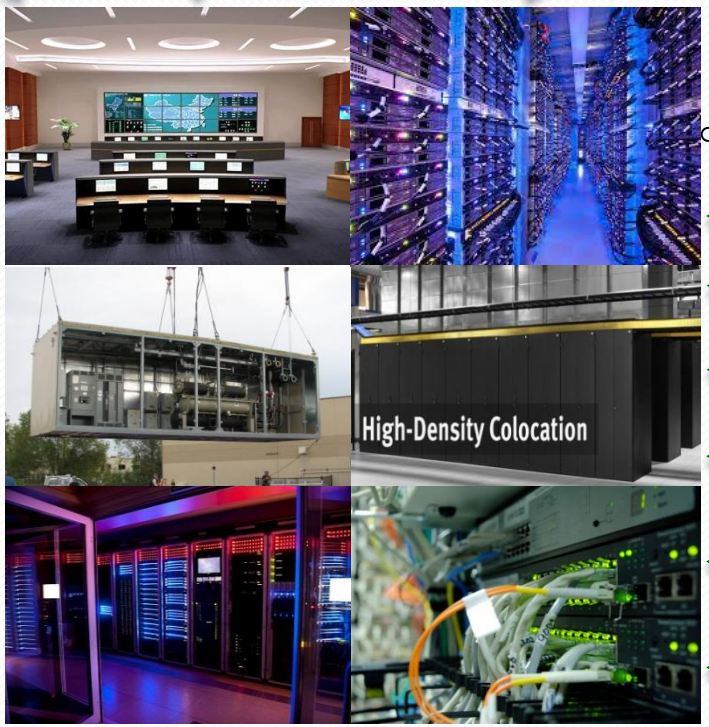
GOVERNMENT/CORPORATE/ UNIVERSITY/NON-PROFIT (15)

CONTAINERS (14)

CAPEX vs. LEASE/OPEX (13)

PERSONNEL (12)

SERVICE LEVEL AGREEMENTS (11)



CLOUD (4)
Internal/
External

DISASTER RECOVERY (5)

CO-LOCATION (6)

MIGRATION/RELOCATION (7)

COMPUTER SOFTWARE (8)

MODULARITY/SCALABILITY /RELIABILITY (9)

COMMUNICATIONS/ NETWORK (10)

V. Data Center Ranking

Numerical Ranking	Terminology	Summary Definition
(1)	Unreliable	Shared power and cooling; No generator; No fire separation (standard construction materials); No fire suppression
(2)	Unreliable/Improved Power	Dedicated unconditioned power; Shared building cooling; No generator, no TVSS; Non-redundant air conditioning; No fire separation; Wet or no sprinklers
(3)	Unreliable-Improved Power/Cooling	Independent power and cooling; No UPS, generator or TVSS; Non-redundant dedicated A/C; No fire separation; Wet or no sprinklers
(4)	Conditioned	Dedicated power and cooling; Conditioned power (no UPS or generator); Dedicated non-redundant A/C units; Limited fire rating (<1hr, wet sprinklers)
(5)	Isolated	Dedicated power and cooling systems; Single UPS (no back-up), no generator; Non-redundant dedicated A/C units; Fire rating of 1 hr.; Limited/wet suppression
(6)	Improved-Isolated	Dedicated power, UPS and cooling; Redundant dedicated A/C units; No generator; Fire rating of 1 hr.; Smoke detection/pre-action sprinkler system
(7)	Reliable	Dedicated power, UPS, cooling systems; Redundant & dedicated A/C units; Single back-up generator; Fire rating 1 hr, intelligent detection system; Pre-action sprinkler system
(8)	Reliable/Redundant	Dedicated & redundant power and cooling components; Redundant UPS, A/C, generators; Dedicated generators/single fuel system; Fire rating 1 hr.; Intelligent detection system; Pre-action sprinkler system; Optional gaseous fire suppression system
(9)	Highly Reliable	Fully redundant: (power train, cooling systems); Redundant UPS's, A/C, generators, fuel systems; Physical segregation of redundant systems; Fire rating 1 hr.; Intelligent detection system; Pre-action sprinkler system; Optional gaseous fire suppression system.
(10)	Geographically Hardened & Redundant	All redundant: (power train, cooling system, UPS systems, generators, fuel systems); Physical segregation of redundant systems; Fire rating of 2 hr.; Intelligent detection system; Pre-action sprinkler system; Optional gaseous fire suppression system; Site is hardened for weather and geographic exposures; Location minimizes exposure to jurisdictional closure from hazardous spill, acts of terrorism, sabotage or similar risks.

VI. BRUNS-PAK Strength & Differentiators

BRUNS-PAK's company "Strengths" and "Differentiators" are best summarized in the following categories:

1) BRUNS-PAK's 'IT Oriented" Project Methodology and Process. This aspect insures that the data center facility infrastructure cloud and colo requirements and consolidation/migration plan for the "hybrid" data center/cloud/colo solution are based on the assessment, analysis, and modeling of the clients short and long plans for corporate information technology.

2) BRUNS-PAK's 45 years of experience in providing data center services for all three phases of a data center facility/IT project: Consulting – Design/Engineering – Construction/Migration/Relocation. This aspect insures an "on-time" and "on-budget" project outcome.

3) BRUNS-PAK's 45 years of data center "construction" experience integrated into the BRUNS-PAK design/engineering and construction bid documents. This aspect "optimizes" the construction phase and insures the lowest cost of ownership for the client.

4) BRUNS-PAK's ability to provide definitive (±15%) facilities and IT construction budgets as a deliverable item for the Phase I/Phase II Consulting Design/Engineering engagement. This aspect avails a client the opportunity to review options and alternatives with a high confidence level because the construction/implementation costs submitted during the budgeting process are provided by a firm with 45 years of data center facility/IT design and construction experience for any client.

5) BRUNS-PAK's vendor/solution neutral delivery of data center/cloud/colo "hybrid" solutions.

6) BRUNS-PAK's best practice delivery of data center trends.

7) BRUNS-PAK's recognized by the "technology" community as a vendor neutral/solution neutral service provider.

8) BRUNS-PAK's historical 98% repeat customer basis.

9) BRUNS-PAK's recognition by global fortune 500 institutions (J&J, CVS, Dell, IBM).

10) BRUNS-PAK's commitment in delivering technically proficient, cost effective, modular/scalable/flexible comprehensive data center/cloud/colo solutions.

VI. Customer Success Stories

Sea Island, GA

Tempe, AZ

Stratford, CT

Englewood, CO

Washington, PA

St. Louis, MO

Alberta, Canada

Santa Ana, CA

Pearl River, NY

Pittsburgh, PA

Orlando, FL

Lakeland, FL

Rochester, NY

Edmonton, Alberta

Atlanta, GA

Ogden, UT

Cleveland, OH

Omaha, NE

VII. Recent Success Stories

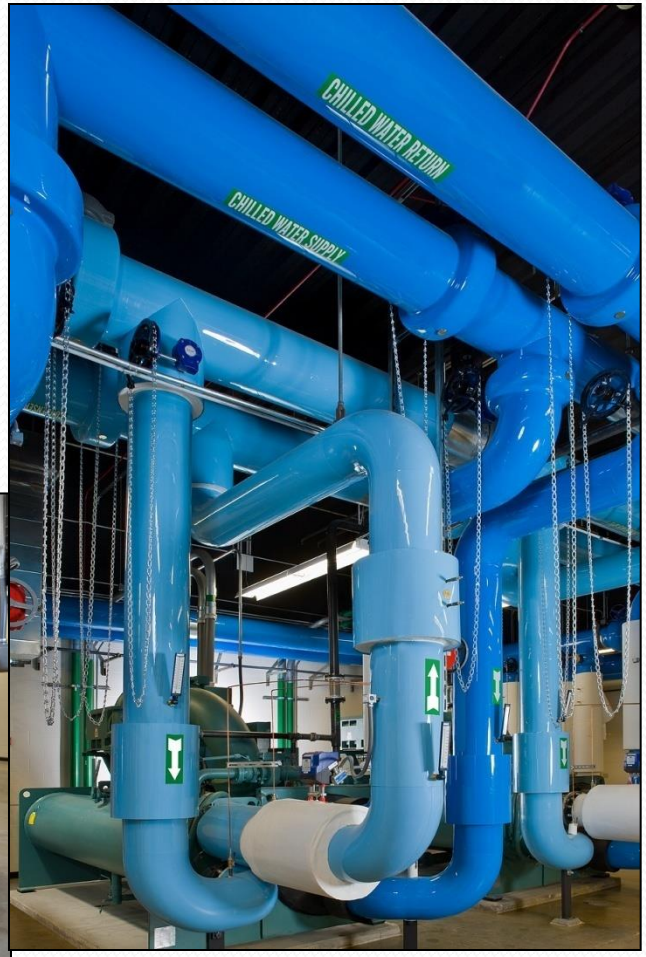
- ✓ *New partnership with World Wide Technology and Hitachi*
- ✓ *Worldwide Global partnerships with AECOM & GHD*
- ✓ *$21 mm facility upgrade for Clemson University*
- ✓ *"Hybrid" Solution Assessment for the largest cable/internet provider in AK*
- ✓ *MEP Lifecycle Upgrade for Liberty Mutual*
- ✓ *Ongoing Life Cycle Upgrades/Expansion for CVS*
- ✓ *Recent partnership with IBM/Anixter/ComNet*
- ✓ *Onboarding with EQUINIX as a preferred "services" partner*
- ✓ *Rutgers University "preferred vendor" for facilities/IT project management, consulting, design, engineering, construction management, commissioning services (1900 buildings)*
- ✓ *Expanded partnership with Sirius Computer Solutions/CDW*
- ✓ *Completion of DR Dispatch Center for CSX*
- ✓ *Selected consultant for US Gov't. Top Secret Installation*
- ✓ *Developed partnership with largest "Opportunity Zone" Fund in the US*
- ✓ *Selected partner with top architecture firm for VA data center rollout*
- ✓ *$100mm IT/data center building for top international bank*
- ✓ *6,500 acre data center/solar/geothermal development project in NM*

VIII. Future Plans & Road Map

- ✓ *Continue to be an "IT Focused" data center/cloud/colo consultant…design/builder*
- ✓ *Expand our existing Fortune 1000 relationships*
- ✓ *Become the "trusted advisor" for the cloud/colo providers*
- ✓ *Continue to expand our North American service offering globally*
- ✓ *Broaden our "partnership network"*
- ✓ *Support the private equity community as their go to data center advisor/design-builder*
- ✓ *Enhance the "stellar" reputation BRUNS-PAK has in the data center community over the next 45 years*
- ✓ *Continue to conduct our business honestly, ethically and straightforward and strive for 100% repeat customers*

IX. Why BRUNS-PAK?

- Our core business is data center/IT/AV/LV/ Security/Cloud/Colo Consulting/Design/ Construction
- We understand your client's data center/cloud/colo operational objectives.
- We are on the cutting edge of data center/IT/ HPC/Edge/AV/LV/Security/Cloud/ Colo/"Smart" solutions.



IX. Benefits to You and Your Client

- Team work approach.
- GOAL: You and your clients will be provided with a Data Center/HPC/ IT/AV/ LV/Security/Cloud/Colo/Edge Strategy that meets their short and long term objectives.
- Extensive experience/cross sectional Data Center/IT/AV/LV/Security/ Cloud/Colo experience with hundreds of examples of on-line work history in operational environments.
- Long term commitment to our customers.
- Single point of contact.

IX. Benefits to You and Your Clients

- BRUNS-PAK is driven by customer satisfaction
- Long term relationships with computer hardware manufacturers
- Consulting experiences to clients that provide alternative solutions
- Integrators of facilities with information systems - technological alternatives

Client/BRUNS-PAK Data Center Facility/IT Infrastructure Services "Buzzwords"

A data center facility/IT/infrastructure/cloud "need" exists for Client/BRUNS-PAK's services when you hear your IT/facilities team say the following:

- ✓ ***We are considering "cloud" services and want to develop options/costs and a migration plan.***
- ✓ We are considering a colocation option and want to know the costs associated with that decision.
- ✓ ***We are refreshing our server technology with higher density equipment (HPC). What is the impact to our existing D.C.?***
- ✓ ***We haven't had a data center "assessment" in many years and need to identify our single points of failures.***
- ✓ How much does it cost to design and build a new data center? Renovate an existing data center?
- ✓ ***We are utilizing blade servers/dense SAN disk arrays/large UNIX and mainframe servers and we are experiencing "hot spots" and thermal overload problems.***
- ✓ We are in the planning stages for a new Data Center/NOC/WOC/Co-location/Cloud/Edge facility.
- ✓ ***We are embarking on a data center facility retrofit, renovation, or expansion.***
- ✓ We are relocating our data center/corporate headquarters.
- ✓ ***We are consolidating our data center operations.***
- ✓ We need assistance with wireless capacity planning and implementation.
- ✓ ***We have a new HQ and need LV/AV/Wireless/Security design and construction assistance.***
- ✓ We are designing/building a cold/warm/hot disaster recovery site.
- ✓ ***We are deploying HPC and have electrical/mechanical challenges.***
- ✓ We are out of power/cooling in our data center.
- ✓ ***We need to add an additional generator/UPS/PDU/CRAC Unit to our data center.***
- ✓ Our business continuity planning group is looking into DR options and the reliability of our primary data center.
- ✓ We are going through a merger/acquisition.
- ✓ ***We need to upgrade the reliability of our data center.***
- ✓ We need to know our options, cost estimates, and timelines for our future data center plans.
- ✓ ***We want to investigate all of our data center facility options…renovate existing (CAPEX vs. OPEX), design/build new (CAPEX vs. OPEX), colo, cloud, containers/pods, network/wifi and/or hybrid approach.***
- ✓ We want to investigate our TCO and ROI for our data center "hybrid" options.
- ✓ We want the data center to be LEED certified.
- ✓ We need to perform a CFD analysis.
- ✓ ***We need to perform an energy audit/carbon footprint reduction analysis.***
- ✓ ***We need an "Edge Consulting/5G" Analysis.***
- ✓ We need to upgrade to CAT6/6A wiring.
- ✓ We want to redesign our network.
- ✓ ***We are designing/building a new data center.***
- ✓ ***We need a "Lifecycle" Replacement Analysis.***

Paul D. Evanko - SVP BD & Strategic Alliances
BRUNS-PAK
999 New Durham Road, Edison, NJ 08817
PH: 732-248-4455, Cell: 732-754-1794
Email: pdevanko@bruns-pak.com

BRUNS-PAK Historical Sales Success Process:

BRUNS-PAK Facility Infrastructure Consulting Services

High Level Audit

- Typically one (1) on-site meeting per site, three to four (3-4) week engagement.
- No IT programming/modeling/ impact on the infrastructure design.
- Ten to twenty (10-20) page report.
- Summary in format.
- High level observations and commentary.
- General recommendations.
- Construction cost estimate ranges – orders of magnitude. Identifies existing status and deficiencies. (#1)
- Provides general "current status" conditions of existing facility.
- Provides high-level "Gap Analysis" commentary (#2)

vs.

Comprehensive Assessment

- Three to four (3-4) on-site meetings, eight to twelve (8-12) week engagement
- *IT Programming* - Analysis of current IT plan and future growth.
- 80-150 Page report subject to size, complexity, etc.
- Detailed in format.
- Detailed analysis.
- Detailed recommendations and opinions.
- Definitive construction budget estimates. (±15%)
- Identifies existing status, deficiencies and viable options/ alternatives for corrections/improvements/upgrades. (#3)
- Provides the "Support Infrastructure Plan" for corporate IT and the "Program Set of Requirements for the project. Analysis of work flows and adjacencies.
- Evaluation of Green/LEED and energy saving options.
- Conceptual floor plan.
- Equipment block diagrams.
- Mechanical flow diagrams
- Electrical single line drawings.
- Project schedules.

See next pages for "specific" comprehensive assessment

- *#1 - Step 1 in developing a data center facility strategic roadmap (#2, 3, 4 to follow)*
- *#2 - General recommendations for improvements/upgrades, Gross magnitude cost range for stated recommendations.*
- *#3 - Tells you in general terms where you are today, how you compare to best practices, and the positive and negative aspects of the facility.*
- *#4 - BRUNS-PAK provides an expert and experienced opinion of what the options and alternatives are for the data center facility infrastructure based on the client provided summary IT/Facility requirements.*

BRUNS-PAK Historical Sales Success Process:

BRUNS-PAK Facility Infrastructure Consulting Services

Single Point of Failure (SPOF)

- Assess an end users existing data center facility electrical/mechanical infrastructure support systems.
- Review the existing condition ("as-built") electrical, fire protection, and mechanical drawings associated with an end users data center.
- Identify potential facility infrastructure components that can interrupt the end users operation that results in any single points of failure/risks associated with potential "impacts" to the reliability/uptime associated with the site.
- Provide recommendations associated with the elimination of single points of failure identified along with construction cost estimates for any stated recommendations for improving the reliability/uptime for the data center facility.
- Corresponding magnitude budget estimates/ranges with schedule for each recommendation provided.

CFD Analysis (Computational Fluid Dynamic Model/Thermal Airflow Analysis)

- An underfloor and above floor environment is modeled.
- Models both supply and return to validate that the hot air discharged from the hardware is not recaptured into the supply air stream.
- Ensures that failure simulations are performed to validate redundancy requirements.
- Confirms concepts will perform as intended.
- Allows for a predictive solution can be designed.
- Corresponding magnitude budget estimates/ranges with schedule for each recommendation provided.

Lifecycle Replacement

- Confirm the age of each critical (or select) piece of infrastructure equipment that supports the Data Center.
- Identify the recommended life cycle replacement age based on industry best practices:
  a. Which equipment is past due for immediate replacement or should be replaced in one (1) year or less - High Priority.
  b. Which equipment could be anticipated to need life cycle replacement within the next five (5) years - Medium Priority.
  c. Which equipment is not expected to need replacement for five (5) years or greater – Low Priority.
- Identification of systems that are up for lifecycle replacement will be portrayed in an easy-to-follow matrix.
- Provide recommendations associated with major equipment recommended to be replaced (where applicable) suggesting whether said equipment should be replaced "in kind" or "upgraded" based on future growth model.
- Corresponding magnitude budget estimates/ranges with schedule for each recommendation provided.

BRUNS-PAK Historical Sales Success Process:

BRUNS-PAK Facility Infrastructure Consulting Services

ESG/Carbon Zero (0)

- A consulting study will involve collecting general building envelope data such as the size, building type, construction, energy sources, utility demand history, and workflows.
- The typical facilities infrastructure support equipment that will be analyzed in the analysis will include (as applicable): lighting, the utility bill, electric motors, variable speed drives, the HVAC systems, building management systems, the building water service and heat recovery related equipment.
- Identify and recommend energy efficiency/reduction areas that reduce the carbon footprint, decrease the operating cost, and improve the green initiatives for the architectural/mechanical-electrical-plumbing superstructures.
- Input to future growth projections shall be supplied by the end user for the development of a more energy efficient data center by utilizing the new energy efficient data processing equipment and techniques.
- Energy saving alternatives or energy conservation measures (ECMs) will be developed to best fulfill the an end users energy management philosophy, while taking into consideration the short/long term computer equipment growth projections and desired reliability level for the data center facility.
- Corresponding magnitude budget estimates/ranges with schedule for each recommendation provided.

HPC (High Performance Compute) Study

- Field verification of the end users site designated for the proposed High Performance Compute (HPC) area.
- Interviews with HPC Data Center stakeholders to establish/confirm the end users preliminary set of data center program requirements and the proposed short/long term projected data/telecommunication growth plan.
- Provide a conceptual short/long term Data Center computer equipment floor plan that optimizes work flow, provides technical efficiency, and maximizes adjacencies.
- Develop a Data Center facility infrastructure program set of requirements based Data Center stakeholders interview(s).
- Offer recommendations, options, and performance criteria for systems that will be supporting the HPC environment in a best practice, leading technology, vendor neutral, format.
- Corresponding magnitude budget estimates/ranges with schedule for each recommendation provided.

BRUNS-PAK Historical Sales Success Process:

BRUNS-PAK Facility Infrastructure Consulting Services

Immersion Cooling Feasibility Study

An assessment of the viability of immersion cooling for the specific application or industry under consideration. This report would analyze the technical, economic, and environmental factors to determine if immersion cooling is a suitable option. Potential deliverables in the Feasibility Report could include:

- Cooling Performance Analysis which will be a detailed evaluation of how immersion cooling performs compared to traditional cooling methods. This includes measuring heat dissipation, temperature regulation, and any potential improvements in cooling efficiency.
- Energy Efficiency Evaluation which is an analysis of the energy consumption and efficiency gains (if any) achieved through immersion cooling. This evaluation may involve comparing immersion cooling to conventional cooling systems in terms of power usage effectiveness (PUE) or other relevant metrics.
- Cost-Benefit Analysis which is a comprehensive comparison of the costs associated with adopting immersion cooling technology versus the potential benefits, such as reduced energy expenses, extended hardware lifespan, or improved computing performance.
- Environmental Impact Assessment which is a study of the environmental effects of using immersion cooling, including its carbon footprint, impact on water usage (if applicable), and other sustainability factors.
- Risk Analysis which identifies and evaluates potential risks and challenges associated with implementing immersion cooling, along with strategies to mitigate these risks.
- Hardware Compatibility Review that will examine how various hardware components (e.g., servers, GPUs, ASICs) can be adapted or designed to work effectively with immersion cooling solutions.
- Best Practices and Recommendations which offers a set of guidelines and best practices for implementing immersion cooling systems, including installation, maintenance, and safety protocols.
- Case Studies providing real-world case studies showcasing successful immersion cooling implementations and their outcomes, to provide concrete examples and data.
- Future Outlook providing potential future developments and trends in immersion cooling technology and its applications.
- Supporting Data and Models detailing data, simulations, and models used in the study to validate the findings and allow for future analyses.
- Presentation and Documentation that offers a well-structured, organized report or presentation summarizing the study's findings and conclusions for stakeholders and decision-makers

Data Center Infrastructure Services Timeframe

Schedule duration for "typical projects":

Item	Area	Description	Duration
1	Audits (Existing)/ Preliminary Program (New)	"High Level" Pro's/Con's of the data center with relative magnitude budgets	4-6 weeks
2	Evaluations/Statement of Requirements/Data Center IT Strategic Plans	To determine technical alternatives/definite costs (±10-15%)/schedules associated with "type" of data center	8-14 weeks
3	Thermodynamic (CFD) Modeling Projects	Stand alone based on information technology	8-16 weeks
4	Design/engineering	Detail drawings/specifications for the "option" selected in 1	6-24 weeks (excludes a building shell)
5	Permits	For local authorities to review/approve	Allow 4 weeks
6	General Construction	A function of reliability, size, and location	16-30 weeks (excludes a building shell)
7	Pre-purchase/long lead time equipment	Larger equipment / longer LEAD time Supply Chain Issues	Up to 46 weeks or longer

X. General Discussion

Questions & Answers