DATA CENTER TRACK – NANOG 66

February 9, 2016 – San Diego, CA

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7 Ways to Reduce Your Data Center Risk

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Introduction

Situation

- Application Architectures
- Cost of business downtime

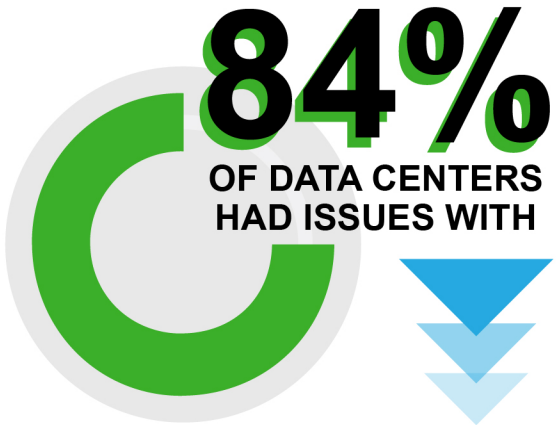
Gartner: "Only 6 percent of companies survive longer than two years after losing data"

The Future

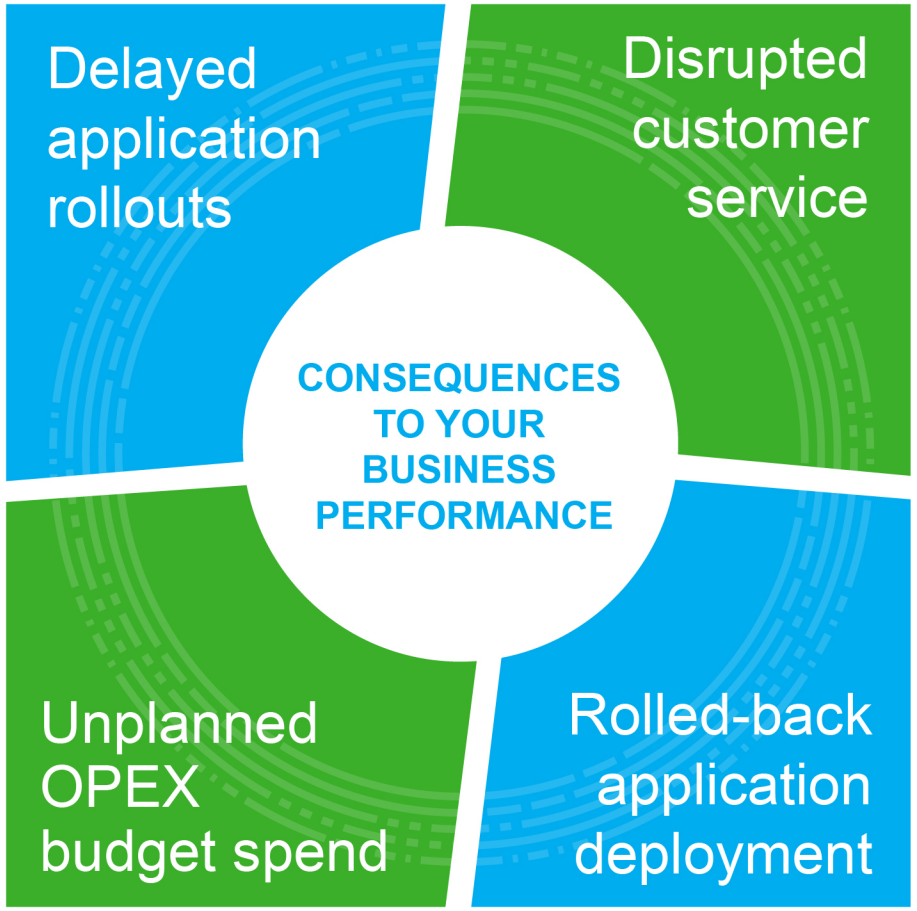
- Mobile Devices Expansion
- Internet-of-Things
- Data Predictions

Takeaway

- Network is Key to future
- Ways to reduce risk

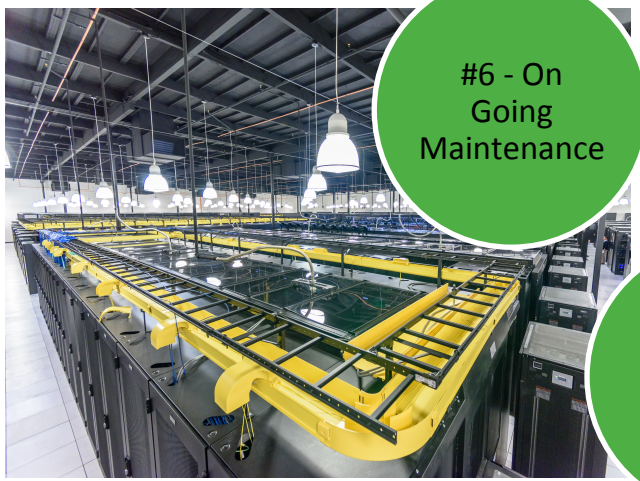


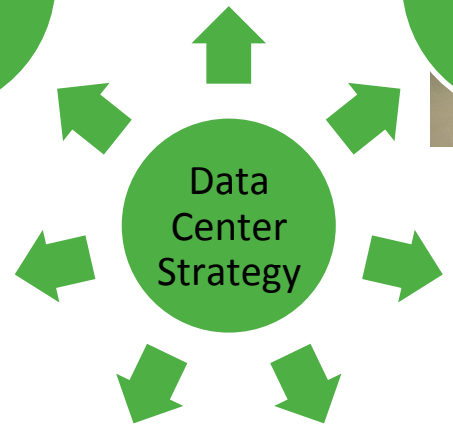
- POWER
- SPACE
- COOLING CAPACITY
- ASSETS
- UPTIME



7 Ways to Reduce Your Data Center Risk

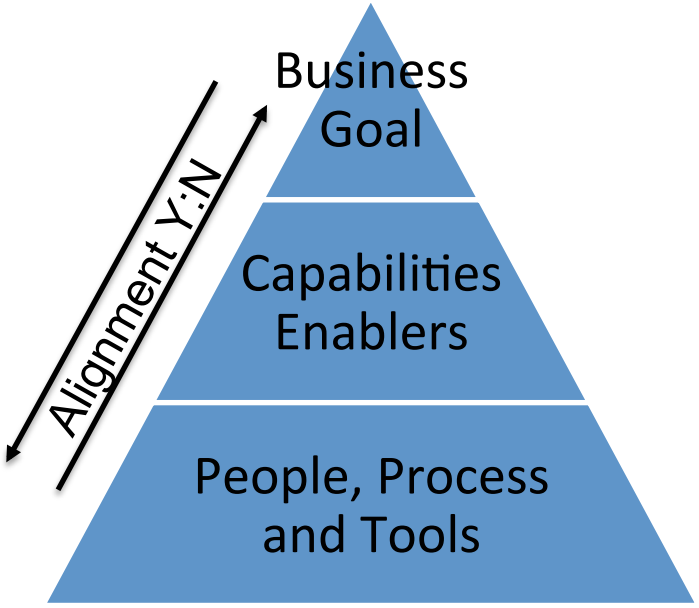
Our data center strategy should have plenty of tactics from which we can choose





#1 - Assess Your Risk

- % Business Fail With Data Loss
- Cost of Downtime
- Application Architecture



Data Center Stakeholders

Mr. Big

- CEO, CTO, CFO

Adeline Architecture

- Business Owner
- Application Architecture

Aaron Administrator

- Compute / Storage (system admin, infrastructure admin)

Network Nick

- Network Services (CCNE, network team)

Facilities Frank

- Operations manager, facilities manager – high density

Calvin Communications

- Communications – Telecommunications manager

Each Data Center Stakeholder has a Different View

Solution Profiles Drive the Demand

Degrees of Separation

Business

CEO, CTO, CFO

- Applications, Hosted, SaaS
- Application Development, PaaS

Line of Business Owner

- Virtualization
- Private Cloud
- Trusted Private Cloud
- Virtual Storage

Administrator

Compute/Storage

- Physical Servers
- Integrated Stack

Network Services

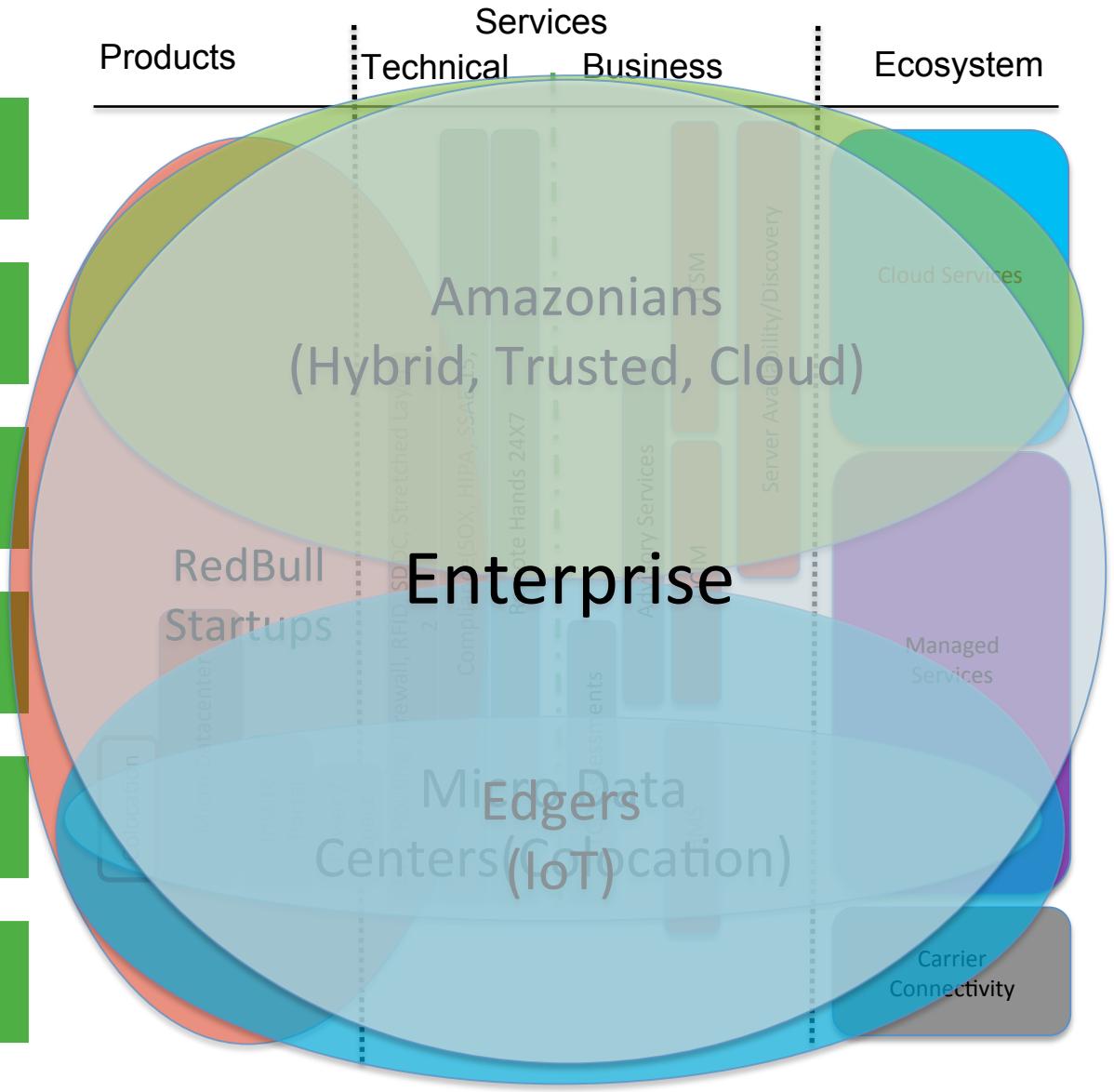
- DNS, Stretched Layer 2, Routing,

Micro Data Center

- Colocation
- Rack, Space, Power, HVAC, Physical Security, Space

Communications

- Back, interconnect, Network, Cross Connects



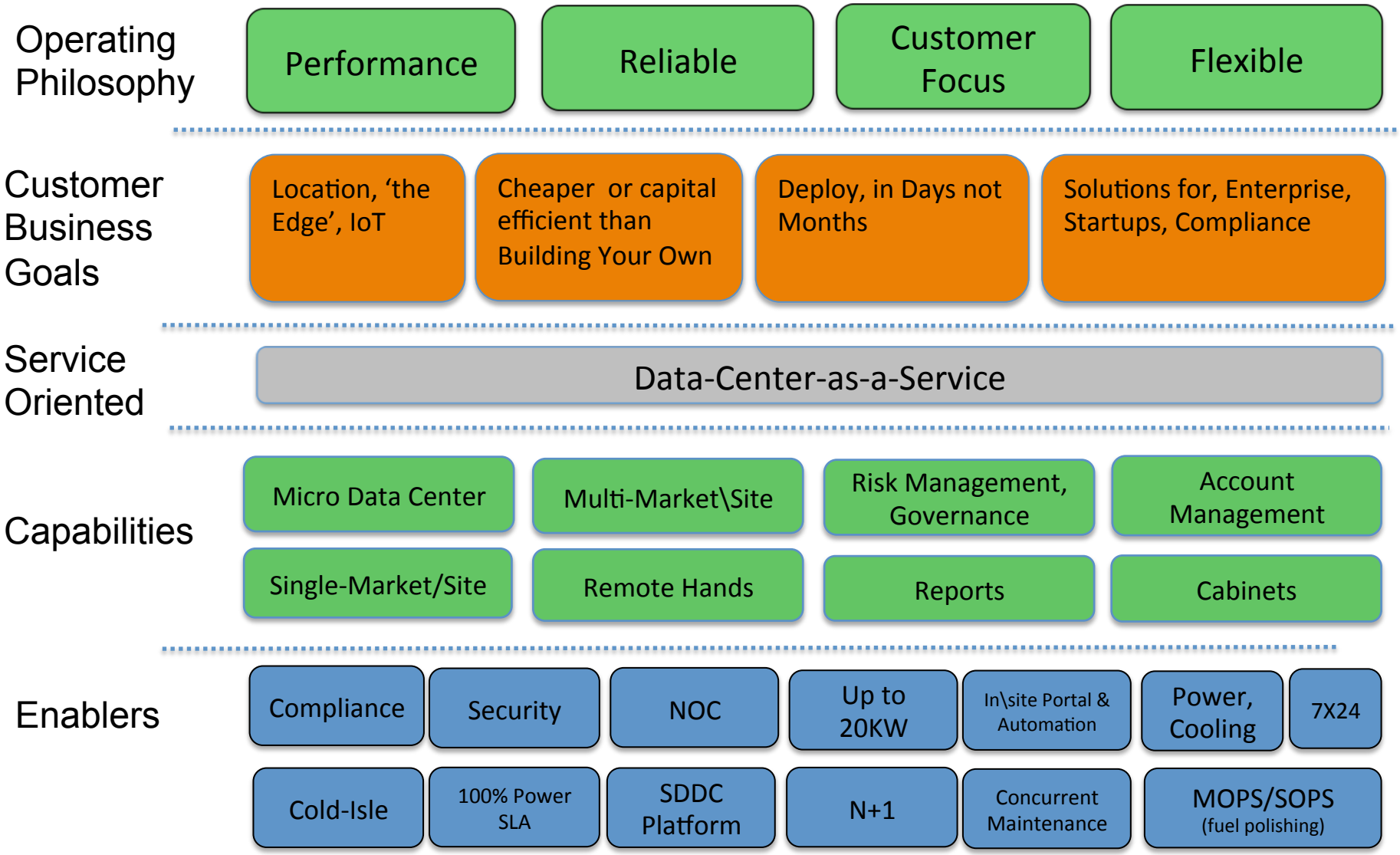
Assessment Takeaways

- Business objective?
- What problem statement (solution paradigm) are you solving for?
- Feasibility of the solution
- Core Competency
- Define the strategy
- Are we aligned and do we have ‘Data Center Stakeholders’ buy-in

#2 - Identify Your Needs

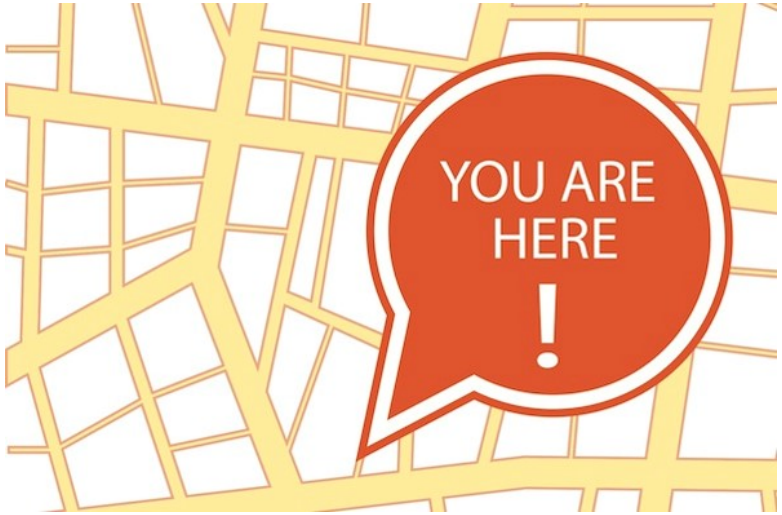
Whenever possible the best time to assess data center risk is during the planning phase. Whether you are considering building a new data center or using a colocation service, this is the time when you want to identify your needs, consider the location, and determine which risks can be mitigated, removed, or simply accepted.

Data Center Value Pyramid



#3 - Location

- Data center location can be a major factor in your data center selection. Certain geographic areas may have increased risk of flooding, hurricanes, or other factors. For certain companies, the speed of transactions is paramount and latency can be a huge concern. Having a data center that is close to your user base will reduce the risk of latency.



Location

- Distance between data centers causes performance issues
- Do you need to be on the edge?
- Does your staff need access to the Datacenter?
- Cloud providers with homogeneous workloads build data centers in remote regions.
- Is the data center in a Flood plan
  - 100 flood plane
  - 500 year plane
  - Outside of that completely

#4 - Redundancy

- N+1 redundancy ensures that if one component fails, there was still be system availability and an independent backup component will be online to take over the work. Utilizing this type of redundancy allows you to take part of a data center offline for maintenance while other sections maintain the load.

Redundancy Takeaways

- How important is redundancy to the strategy?
- Do you have people, process & tools redundancy?
- Application Redundancy
- Clustering of hardware in the DC
- If data center redundancy is required then is the data center N+1 at all levels
- It’s important to drill down and find out what kind of N+1 the provider is providing

#5 - Data Center Process

- Always prepare for the emergency by using a standardized repeatable practices can reduce the risk of human error dramatically within a data center. These processes were created to standardize service quality and ensure data centers are ready when an emergency occurs.

Process Takeaways

- People are the biggest cause of failure in data centers
- Check the process to ensure risks are mitigated
- What are the checks?
- Integrated-system-testing?
- Cross-connect testing?
- Infrared Testing and Predictive Testing?
- Hire people who understand what system downtime means

#6 - On Going Maintenance

- While reducing cost is a primary concern for any business, risking downtime by doing so is not acceptable. Long-term, it is substantially more cost-effective to do ongoing maintenance and upgrades than have downtime when a data center component fails.

Maintenance is key

Maintenance Takeaways

- Ask about the providers maintenance program
- Identify if some are afraid to do maintenance, because humans touching equipment can cause problems.
- Review MOPS & SOPS to ensure "CONCURRENT MAINTENANCE“
- Facilities staff should be involved and not rely on vendors
- Get the know the site-staff by name

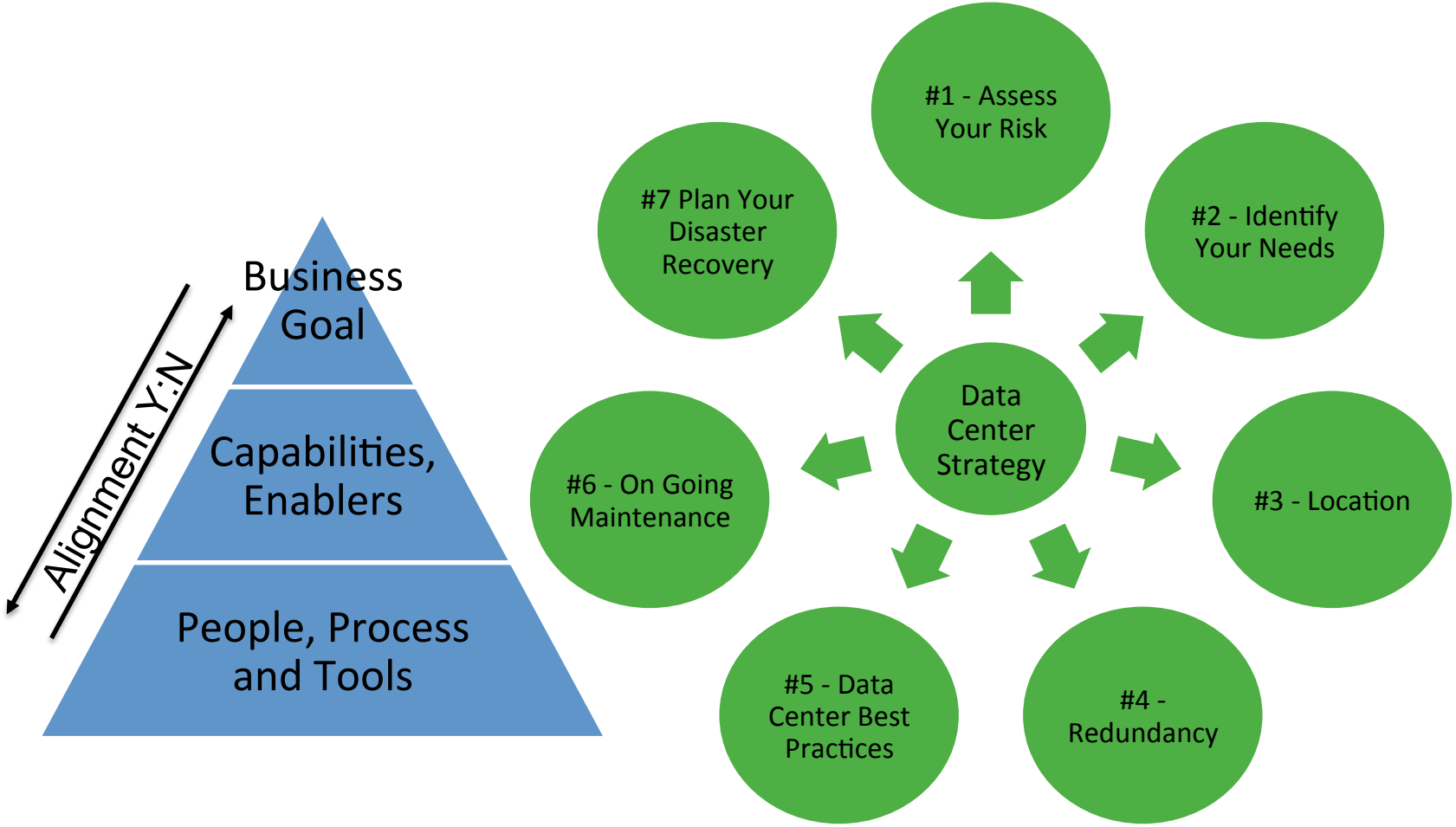
7 - Plan Your Disaster Recovery

- Having a plan ready in case of disaster is critical for data centers. Whether you are building a new data center or utilizing colocation services, following each of these steps will reduce your data center risks. While you can’t keep some disasters from happening, it literally pays to be ready.

7 - Plan Your Disaster Recovery

- What did Sandy, 911 and other disasters teach us about data center disasters.
- Plan your disaster recovery, your people not just datacenters need to be thought of, food, water, showers
- Having a plan ready in case of disaster is critical for data centers.
- Whether you are building a new data center or utilizing colocation services, use cloud or managed service following each of these steps will reduce your data center risks.
- While you can’t keep some disasters from happening, it literally pays to be ready.

Conclusion


Business Goal
Capabilities, Enablers
People, Process and Tools
Alignment Y:N
Data Center Strategy
#1 - Assess Your Risk
#2 - Identify Your Needs
#3 - Location
#4 - Redundancy
#5 - Data Center Best Practices
#6 - On Going Maintenance
#7 Plan Your Disaster Recovery

Questions?

DATA CENTER CONFIGURATION – SO YOU NEED A DATA CENTER – WHAT'S NEXT?

FEBRUARY 9, 2016

NANOG 66

GABE COLE, PRESIDENT, RTE GROUP, INC.

RTE Group

Goals

- Reduce Cost through
  - Competitive process
  - energy efficient operations
  - ***manage cross connect and other costs from outset***
- Improve Delivery by placing equipment and exchanging traffic directly to and from critical networks
- Manage Risk through proper facility selection, contract structure, and governance

Key Factors to Decide

- Market search and competitive process
- Space, power, and low voltage planning
- Network turn-up and cross connect management
- Build management
- Systems integration
- Change control/Problem resolution
- Lease terms, duration, administration

Critical Power Infrastructure

- Understand every aspect of One-Line Drawing
- Single points of failure
- Repair sequence and timing
- Quality of design, procurement, maintenance

Increasing Voltage

- Medium Voltage (>2,500 V) distribution
- Advantages – No conversion loss and heat production, more power stability, fewer points of failure
- Disadvantages – Generators and UPS currently more difficult to procure
- 480 V to the rack – Higher density, reduced CapEx

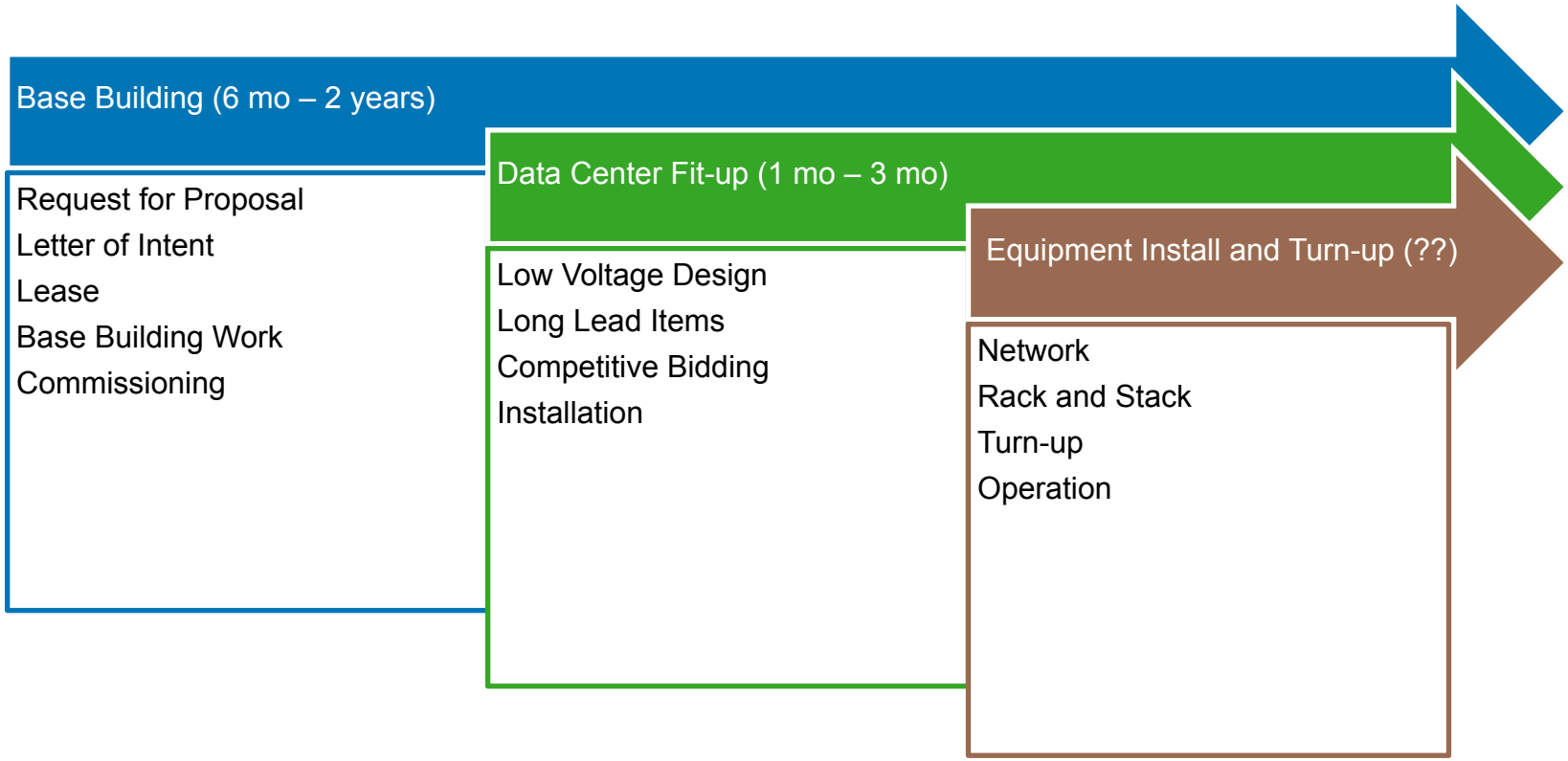
PUE – Power Utilization Efficiency Challenge

- Everyone does it differently
- Cooling is usually averaged across multiple users
- Incentives to standardize and save are not there
- Build a model, validate, use it as an ongoing tool, and innovate
- Structure lease or license to get benefit of your energy savings

Understand Expense Structure

- Net Rent or Gross Rent
- Tax and Operating
- Power Cost
- Cooling Recovery
- Energy Costs/Billing Method/Savings?
- Tenant Operating Cost

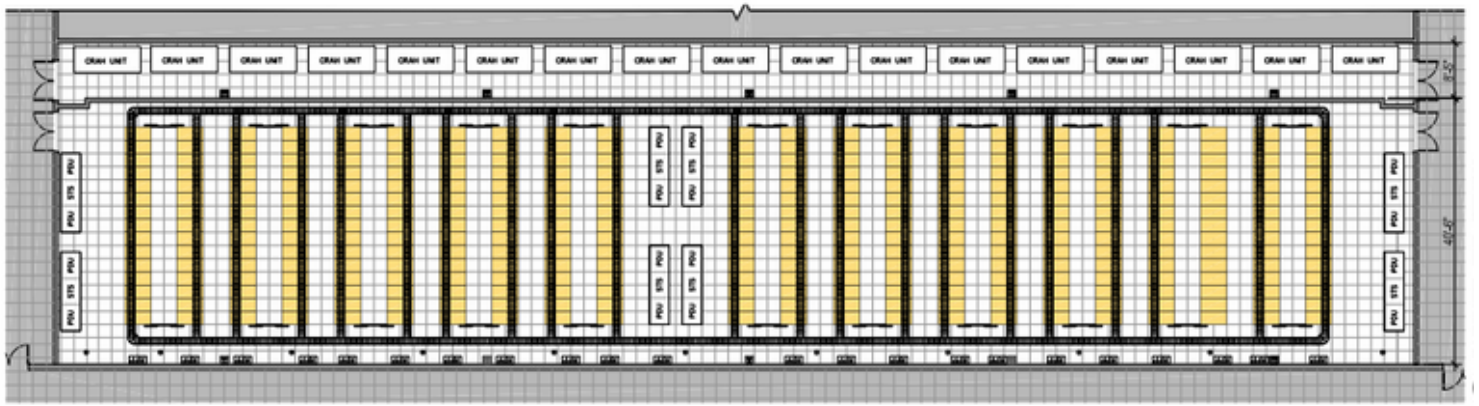
Project Schedule

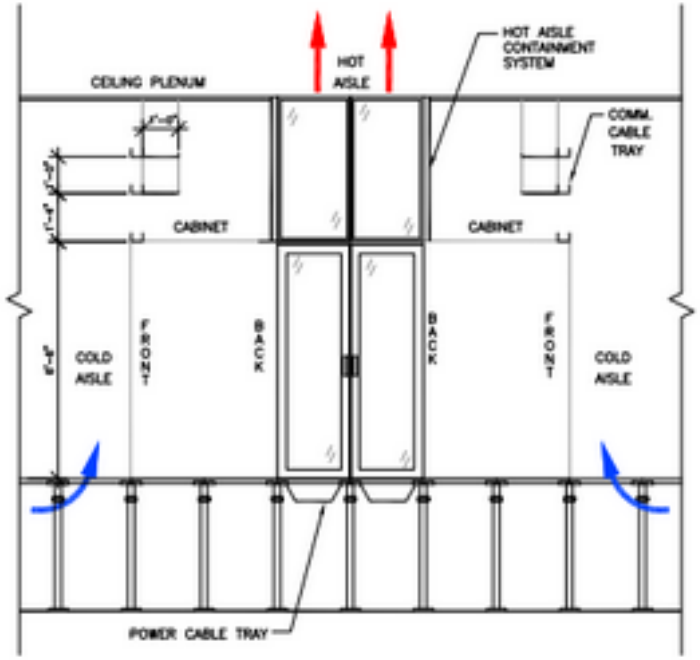


Network Detail

- Available providers
- Network topology
- MMR, Direct, or Mixed
- Dark fiber
- Lit services
- Value added services – Exchange, IP Transit, Cloud

Layout & Design





2 DATA CENTER SECTION
SK-1 1/4"=1'-0"

A Cabinet is Not A Cabinet

			Left Side				Right Side				Front Door					Rear Door					Top Panel		Cable Management					
Width	Depth	Height	(S)olid / (B)rushed	Locking	Color	Ganging Kit	(S)olid / (B)rushed	Locking	Color	Ganging Kit	Locking	Color	(F)lat / (R)adius	(W)elded / (E)xtruded	(S)olid / (P)erforated	Locking	Color	(F)lat / (R)adius	(W)elded/ (E)xtruded	(S)olid / (P)erforated	Front Brushes	Rear Brushes	Front Fingers	Middle Velcro Bar	Rear Fingers	Casters	Levelers	Front & Rear Air Skirts
24	48	42u	B	N	White	Y	S	Y	White	N	Y	White	F	W	P	Y	White	F	E	P	Corners	Full	N	N	N	N	Y	N
24	48	42u	B	N	White	Y	NA	N	NA	N	Y	White	F	W	P	Y	White	F	E	P	Corners	Full	N	N	N	N	Y	N
24	48	42u	B	N	White	Y	NA	N	NA	N	Y	White	F	W	P	Y	White	F	E	P	Corners	Full	N	N	N	N	Y	N
24	48	42u	B	N	White	Y	NA	N	NA	N	Y	White	F	W	P	Y	White	F	E	P	Corners	Full	N	N	N	N	Y	N

Power Distribution Detail

No. of Power Whips	Power Whip Receptical Type	PowerType	MOA Type	MOAs Per Cabinet
1	L6-30	Single-Corded	1P-T4 - 30A 1PH 208V MOA with (40) C13's. (6) C19	1
1	L6-30	Single-Corded	1P-T4 - 30A 1PH 208V MOA with (40) C13's. (6) C19	1
1	L6-30	Single-Corded	1P-T4 - 30A 1PH 208V MOA with (40) C13's. (6) C19	1

Questions?

RTE Group

Panel Discussion

- Gabe Cole, Executive Director Open-IX Association, CEO, RTE Group
- John Hawkins, VP Marketing, vXchnge
- Phill Lawson-Shanks, Chief Architect & VP of Innovation, EdgeConnex
- Craig Weick, Executive Director Co-Location Product Management, CME Group

1. How do I explain data center strategy to the rest of my organization and how can I gain support for data center initiatives?
2. What does the architecture for a “utility model” of infrastructure delivery look like?
3. PUE is becoming less of an accepted power efficiency assessment. What is the current thinking around understanding power efficiency?
4. How do we evaluate actual computing usage and minimize power usage on unused equipment?

Open-IX Update
February 2016

OPEN-IX

Value Proposition

- Standards that focus on critical Physical, Operational, and Community requirements
- Transparent, member supported organization
- Clear, accessible, and economic process
- Database of data centers and exchanges that meet requirements

OIX Status

- 182 Members
- 10 OIX Certified Exchanges in 9 Cities

Amsterdam Internet Exchange
- NY/NJ
- SF Bay Area
- Amsterdam
- Chicago
- Hong Kong

Florida Internet Exchange
- Miami, FL

London Internet Exchange
- VA/MD/DC

Deutscher Commercial Internet Exchange
- New York

Massachusetts Internet Exchange
- Boston

Milan Internet Exchange
- Milan

- 29 OIX Certified Data Centers by 15 Companies

CyrusOne
1. Dallas, TX
2. Houston, TX
3. Austin, TX
4. Cincinnati, OH
5. Cincinnati, OH
6. Phoenix, AZ

DIGITAL REALTY
1. Los Angeles, CA
2. San Francisco, CA
3. Dallas, TX
4. New York, NY

QTS
1. Atlanta, GA
2. Suwanee, GA
3. Richmond, VA

DuPont Fabros Technology
1. Ashburn, VA
2. Piscataway, NJ
3. Chicago, IL

SENTINEL DATA CENTERS
1. Durham, NC
2. Somerset, NJ

zayo
1. Atlanta, GA
2. Miami, FL

CONTINUUM DATA CENTERS
1. Chicago, IL

evoswitch
NEXT GENERATION DATACENTERS
1. Manassas, VA

DATAGRYD
DATA CENTERS | SIXTY HUDSON
1. New York, NY

phoenixNAP
GLOBAL IT SERVICES
1. Phoenix, AZ

Jaguar network
Leading your performance
1. Marseille, FRANCE

DATA BANK
1. Richardson, TX

edgeconnex
1. Houston, TX

VANTAGE DATA CENTERS
1. Santa Clara, CA

SABEY Data Centers
1. New York, NY

International Certification

- There is growing demand for neutrality, openness, service offerings, infrastructure and operations standards in data centers and IXPs around the globe.
- An international standards organization that began in the U.S., Open-IX recently extended the application process for OIX-1 and OIX-2 certification to IXs and data centers around the world.
- Its efforts have successfully increased reliability, resiliency and competitiveness of massive-scale interconnection for all.
- Current international certified data centers and IXs include:
  - AMS-IX Hong Kong (OIX-1)
  - AMS-IX Amsterdam (OIX-1)
  - Milan IX (OIX-1)
  - Jaguar Network (OIX-2)

Dual Certification

OIX-1 Certified IXPs in OIX-2 Certified Data Centers (7)

OIX-1 IXP	OIX-2 DATA CENTERS	LOCATION
AMS-IX Bay Area	DLR San Francisco Data Center	365 Main Street, San Francisco, CA 94105
AMS-IX NY	DFT NJ1 Data Center	101 Possumtown Road, Piscataway, NJ 08854
DE-CIX New York	Sabey Intergate.Manhattan	375 Pearl Street, New York, NY 11201
LINX NoVA	DFT ACC5 Data Center	44521 Hastings Drive, Ashburn, VA 20147
LINX NoVA	EVOSwitch Manassas Data Center	9651 Hornbaker Rd, Manassas, VA 20109
FL-IX	Zayo Miami Data Center	36 NE 2nd Street, Miami, FL 33132
AMS-IX CH2	DFT CH2 Data Center	2299 Busse Road, Elk Grove Village, IL 60007

OIX Initiatives

- Tiered exchange standards including remote peering exchanges
- Lights out data center / micro data center
- “N” Infrastructure
- Enterprise tools
- Education
- Continued International growth

Call For Volunteers