

# Data Centre Design & Implementation: An ROI Approach

*Lambros Kostaras*

*Business Manager, South East Europe*

*gr-lk@panduit.com*

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# Agenda

1. About Panduit
2. Data Centre Market Trends
3. When Data Centres Go Wrong!
4. Data Centre Design Principals
5. Design & Deployment Steps
6. Summary

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# 1. About Panduit

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# About Panduit

- Panduit is a world-class developer and provider of leading-edge solutions that help customers optimize the physical infrastructure and mitigate risk through simplification, increased agility and operational efficiency
- Independent leader since 1955
- Global presence, local focus and customization
- 4,000+ employees
- 112 countries of operation
- Solutions approach
  - Data centers
  - Connected buildings
  - Industrial automation

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# Unified Physical Infrastructure (UPI) Approach

- Flexible, end-to-end UPI-based solutions help meet business and technology
- Challenges head on for a smarter, unified business foundation.



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- **Mitigate Risk** – Efficient physical infrastructure management enables seamless integration to reduce risks which can occur throughout the network
- **Lower Cost** – Panduit physical infrastructure solutions drive financial advantages to reduce energy and occupancy costs, and help secure competitive advantage
- **Increase Agility** – A high level of integration within the physical infrastructure enables flexibility and improved business agility
- **Enhance Sustainability** – UPI-based solution offerings enable organizations to meet sustainability goals by driving resource and energy efficiencies across the physical infrastructure

The UPI approach enables organizations to connect, manage and automate critical systems and drive operational, financial and sustainability advantages, allowing your business



minimize risk, lower cost, and heighten agility and reliability.

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# Panduit's Intelligent Data Center Solution Elements

## Professional Advisory Services

Migration to next generation solutions, mitigating risks in consolidation and virtualization, and achieving greater energy and real-estate efficiency.

## Intelligent Software and Hardware

Complete data center infrastructure management (DCIM) through monitoring of and management of critical physical layer resources.

## Energy Efficient Cabinets

Cooling conservation for greater thermal management and energy efficiency.

## Pre-Configured Offerings

Reduce implementation time and costs by delivering a pre-engineered, pre-tested and validated modular solutions optimized for high technology platforms.

## High Speed Data Transport (HSDT) Copper and Fiber Cabling Systems

Ease of deployment and proven performance to ensure availability, reliability and scalability of mission critical systems.

## Physical Infrastructure Foundation



Ensuring reliability, agility, and security to drive business advantages and overall success.

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# This is what we do with Cisco

*Validated Infrastructures that  
Simplify & Accelerate Cisco Nexus  
7009 Switch Deployments*



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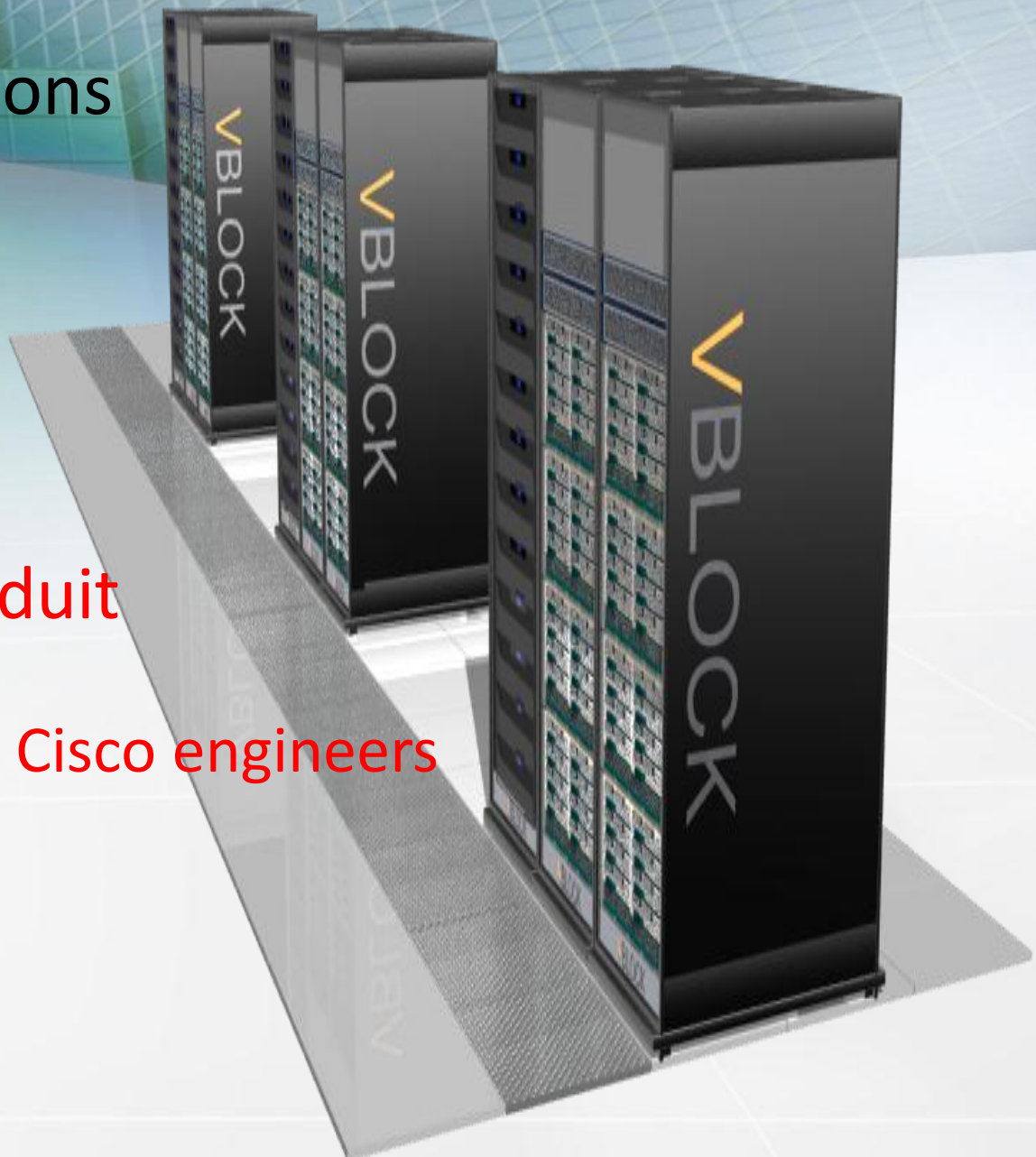
Pre-configured Solutions

Pre-Engineered

Pre-Integrated

Pre-Deployed by Panduit

Validated by EMC and Cisco engineers



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# 2. Data Centre Market Trends

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# Key Data Centre Call Outs

> 2.5 billion users on the Internet as of January 2013. **451 Research**

> Mobile technology is becoming the preferred mode of business and personal life – 500 million new smart phones a year. **451 Research**

> 15 million gigabytes of new data are created each day. **451 Research**

> It is predicted that data will grow 800% in the next five years. **Gartner**

> As of May 2013, 36 percent of large companies surveyed expect to exhaust IT capacity within the next 18 months. **Uptime Institute**

> The average age of data centers is nine-years-old. **International Data Corporation**

> Data centers older than seven years are obsolete. **Gartner**

> Running business in the cloud means cost savings. The rate SMB is moving to cloud is doubling every year. **Biztech**



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# 3. When Data Centres Go Wrong

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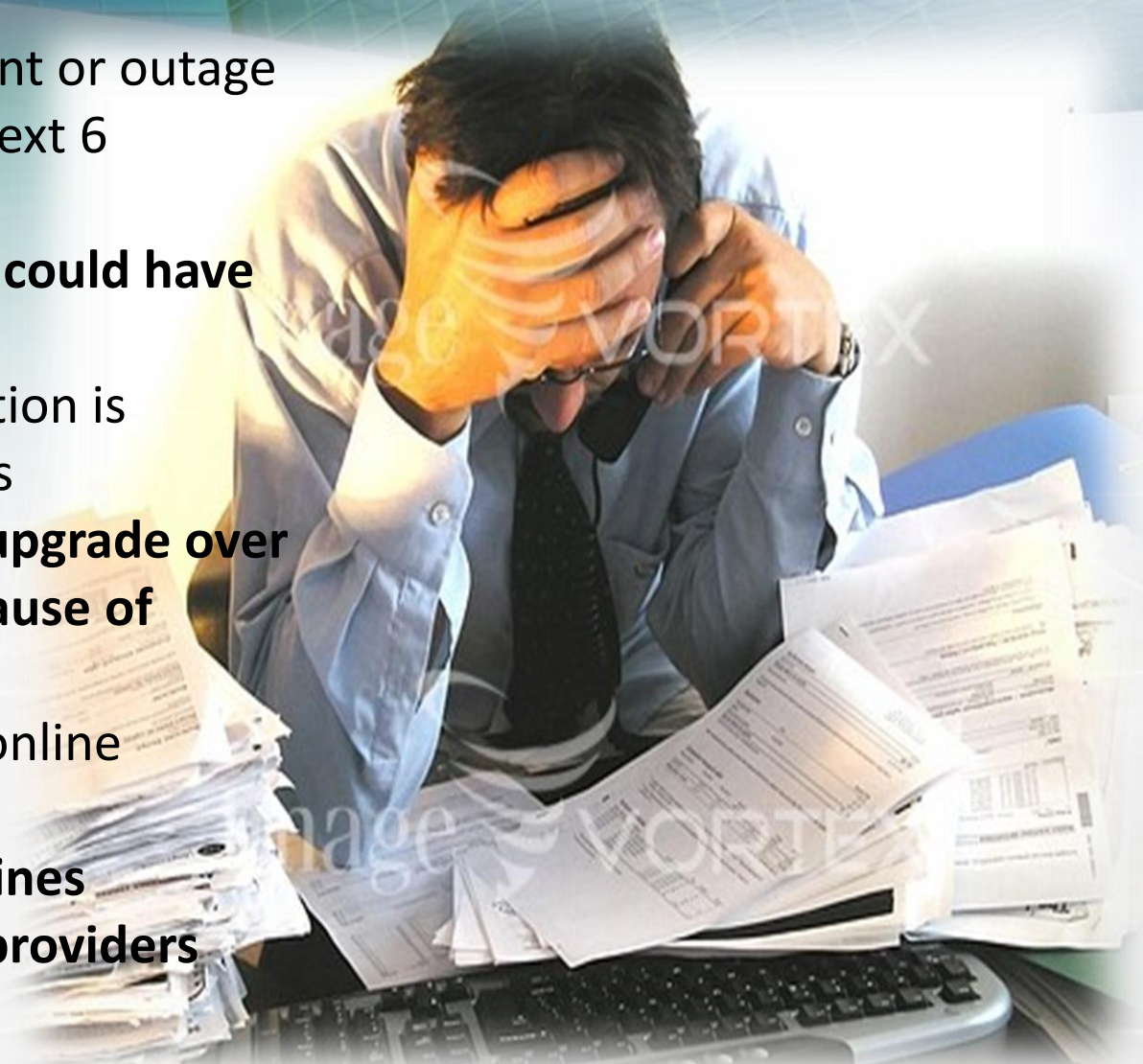


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# Some Facts reported by facility managers

- 60% expect an incident or outage to happen over the next 6 months
- **80% of the incidents could have been prevented**
- Average outage duration is reported 107 minutes
- **80% report a major upgrade over the next 4 years because of inefficiency reasons**
- 90% do not have an online monitoring system
- **Outages make headlines especially for cloud providers**



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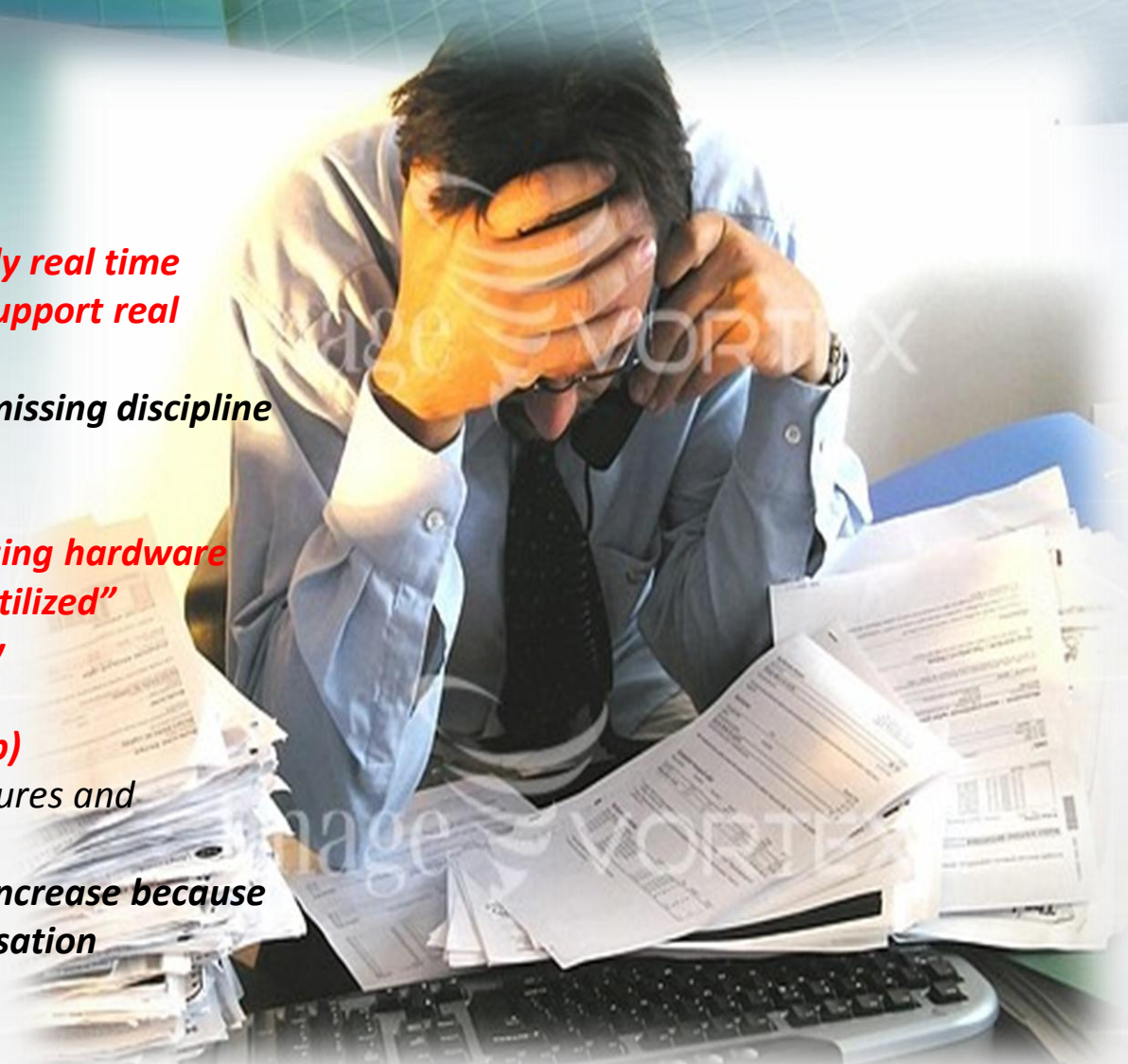


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# Top of mind issues reported by DC managers

- **Energy efficiency**
- **Performance Monitoring :**  
**ASHARE TC 9.9 says that only real time energy measurements can support real energy saving efforts**
- **Capacity Planning or ... the missing discipline and the over-provisioning :**
- **In a recent EMEA survey,**
- **“reclaiming and/or repurposing hardware and software that is underutilized”**
- **was cited as a top priority by**
- **57% of IT executives**
- **responding (TeamQuest Corp)**
- **Deployment of new architectures and technologies**
- **Rapid virtualised workload increase because of consolidation and virtualisation**



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# Cost of a datacenter outage (Ponemon Institute) ...

**Detection cost:** Activities associated with the initial discovery and subsequent investigation of the outage.

**Containment cost:** Activities and associated costs that enable a company to reasonably prevent an outage from spreading, worsening or causing greater disruption.

**Recovery cost:** Activities and associated costs that relate to bringing the organization's networks and core systems back to a state of readiness.

**Ex-post response cost:** All after-the-fact incidental costs associated with business disruption and recovery.

**Equipment cost:** The cost of new equipment purchases and repairs, including refurbishment.

**IT productivity loss:** The lost time and related expenses associated with IT personnel downtime.

**User productivity loss:** The lost time and related expenses associated with end-user downtime.

**Third-party cost:** The cost of contractors, consultants, auditors and other specialists engaged to help resolve unplanned outages.

**Lost revenues:** The total revenue loss from customers and potential customers because of their inability to access core systems during the outage period.

**Business disruption (consequences):** The total economic loss of the outage including reputational damages, lost business opportunities, etc

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# Causes behind datacenter outages and downtime

**Increasing data center capacity.** As demand for IT applications grow and more servers and storage are added to the data center, the supporting IT infrastructure must grow as well. If the IT demand outgrows what the critical infrastructure can supply, downtime will occur. Downtime root cause correlation: UPS capacity exceeded and PDU/circuit breaker failure.

**Rising rack densities.** With the introduction of blade servers and other high-performance IT equipment, the typical server rack will contain well over 10 kWh of IT. High heat densities will require precision cooling closer to the server. However, depending on the cooling design, this also could bring water closer to the server. Downtime root cause correlation: Water incursion and heat-related/CRAC failure.

**Data center efficiency.** Data centers consume a lot of electricity and many managers are evaluating high-efficiency power and cooling technologies such as transformerless UPS or air economizers that provide cost reductions but may not provide the highest reliability or ideal operating environment. Efficiency should not come at the expense of availability, especially in critical data centers. Downtime root cause correlation: UPS failure, heat-related/CRAC failure and IT equipment failure.

**Need for infrastructure management and control.** The data center manager's requirements of improving availability, increasing efficiency, maximizing density and planning for capacity all can be managed through infrastructure management. Monitoring the float charge of a battery, knowing optimal placement of a new server to even having a people-free facility with remote resolution all are aspects of successful infrastructure management.



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# The Datacenter stakeholders and Panduit's role

1. The technical or facility dept
2. The IT dept
3. The external electromechanical consultant (by law)
4. The finance dept

**Panduit speaks all different languages and makes the bridge by providing the methodology to have all stakeholders achieve common goals by :**

1. Providing design & assessment services, solutions and products to meet standard requirements : TIA 942, EN directives, IEEE 1100, Uptime Institute & ASRAHE guidelines, Telcordia, LEED etc
2. Defining optimization models (UPI) and support industry best practices
3. Working on reference architecture development together with partners like Cisco (NEXUS)

4. Ensuring a holistic approach at all design, assessment, deployment phases.
5. Providing optimization tools to effectively REMOVE THE WASTE, maximise ROI, meet SLA GOALS
6. Offering asset management, service management and energy management solutions
7. Mitigating risk and reducing operating costs by offering on line monitoring and management
8. Using a multiphase modular methodology.

[In physics, your solution should convince a reasonable person. In math, you have to convince a person who's trying to make trouble. Ultimately, in physics, you're hoping to convince Nature. And I've found Nature to be pretty reasonable.](#)

**Frank Wilczek**

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# 4. Data Centre Design Principals

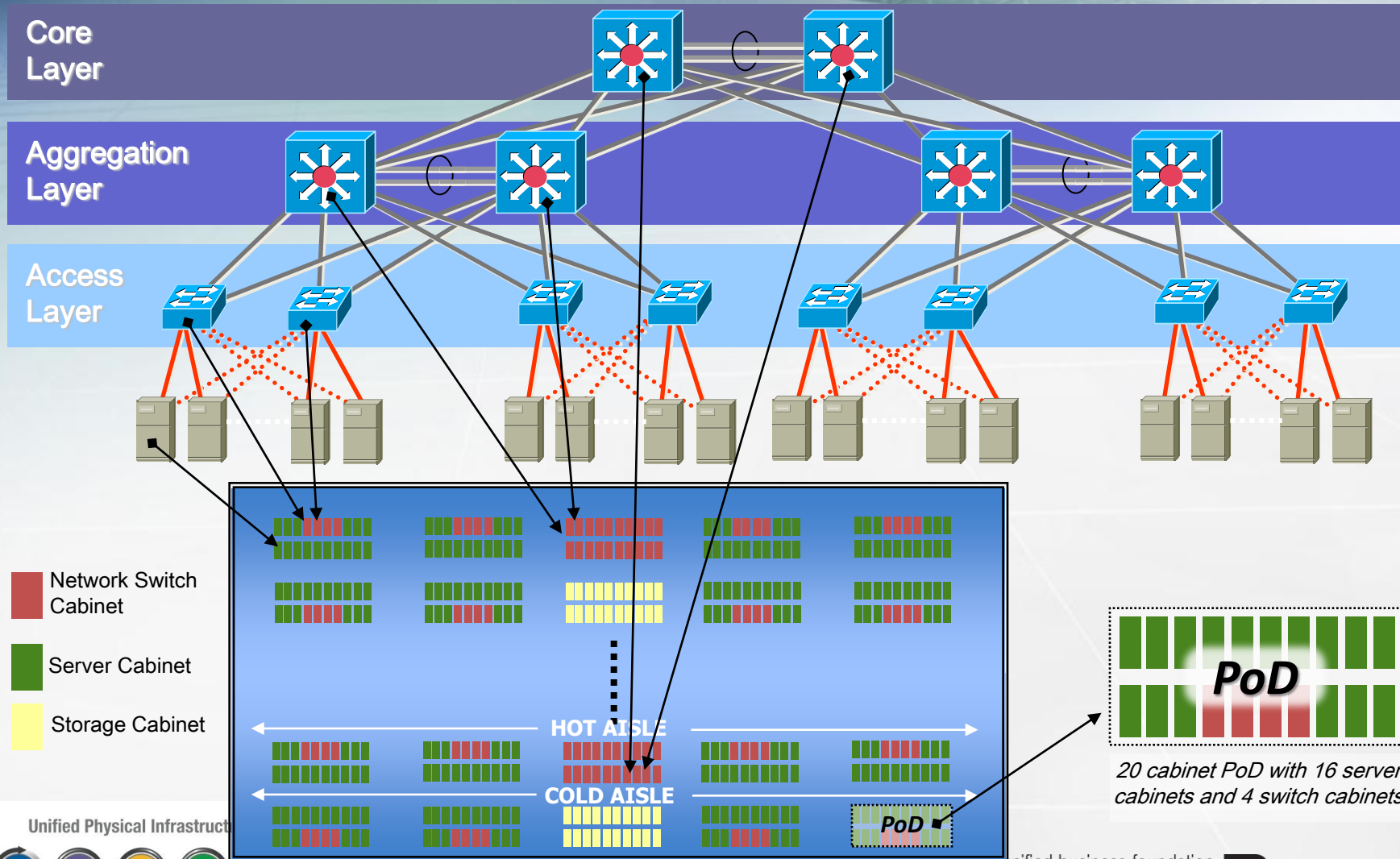
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# Mapping Logical to Physical Layers

## Cisco architecture to TIA 942



20 cabinet PoD with 16 server cabinets and 4 switch cabinets



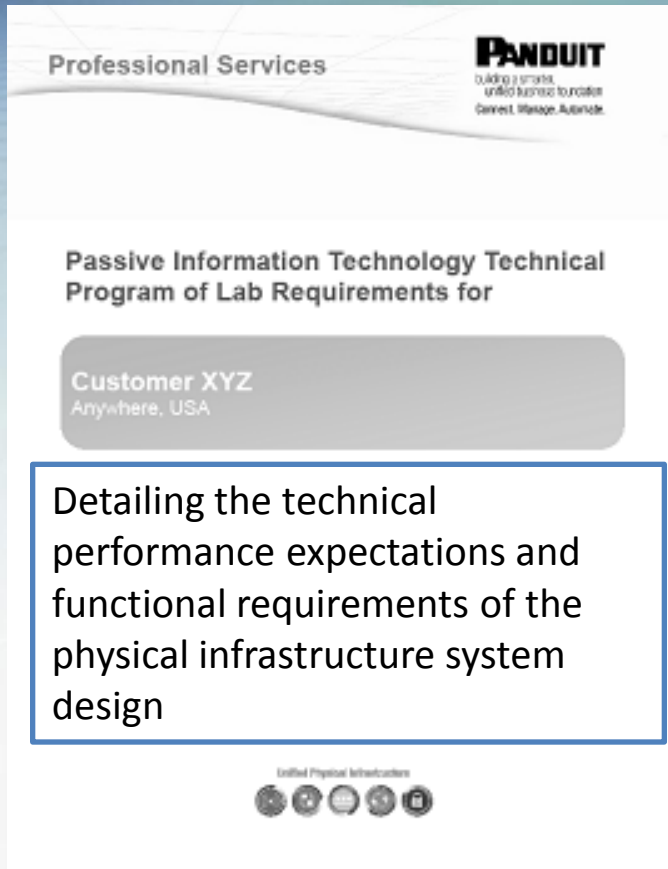
# 5. Design & Deployment Steps

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# Phase 1 Deliverables – Program Report



design of the telecommunication  
by the contracted scope of work  
that follow. These descriptions reflect  
Panduit's understanding of the

will make use of a Horizontal  
System Area (ESA). The ESA will serve  
and/or cross-connect to the ESAs.  
ESL, including computing systems and  
purpose of the HSA.

are to remain. As such, they are

be located on the Customer ES2  
room's requirements. However, for design  
and enclosure.

placement and provide for clearing  
over time.

Air Conditioner (CRAC) units is not  
equipment, consideration should be given  
prior to the time. A CFD analysis is  
an cost-effective and efficient solution.

remain. However, some re-alignment of  
ground design.

is clearance required by applicable  
code to the location and quantity of ESAs  
required. Additionally, the existing space  
in front of the ESA cabinet room,  
installed and removed during move,  
equipment Panduit recommends a

into an enclosure, between the HSA  
by type and signal, this remedy should  
be required.

optimal as it terminates directly into  
cabinet walls in all locations, insufficient  
a suspension system; provide through  
a (shorted pathway) to the wall) and  
and CRAC units. Serious consideration  
already to address the issues identified  
in fiber pathway.

placed with wider cable tray.

equipment rise will be provided with, ID-  
art the termination hardware and to  
an ESA room, an area identified on the  
a metallic enclosure on ceiling.

closure will be determined as Owner  
current and future equipment in-  
formation accessories are needed to

directly attached to the metallic cable  
in. These existing racks provide  
a. Panduit recommends retaining the  
the new 24 port, flat patch panel.

and 10-Gig, multi-mode, OM4 optical

able assemblies in the HSA, cable  
1), signal, 18U patch panel, to the ES2,  
and 24 port, flat 18U patch panel.

as manufactured by Panduit®.

igned to reduce unwanted  
a quality and the operational safety of  
or fault currents.

shall be provided from the building  
entrance to the Telecommunications Main

ed in accordance with J-STD-607-A, will  
a Grounding Busbar (GDB) in the lab.

appropriately sized, bare-stranded  
busbar will be bonded to the access floor

be a listed copper busbar, 75 inch  
the required connections. The TSB will  
section of two-hole lugs, as prescribed

heart and permanent means, using a  
of the same size to the electrical

own Equipment Grounding Busbar (EGB)  
panels) with the rack or enclosure.  
able of cables contained within or  
of the EGB.

will be bonded on one end only.

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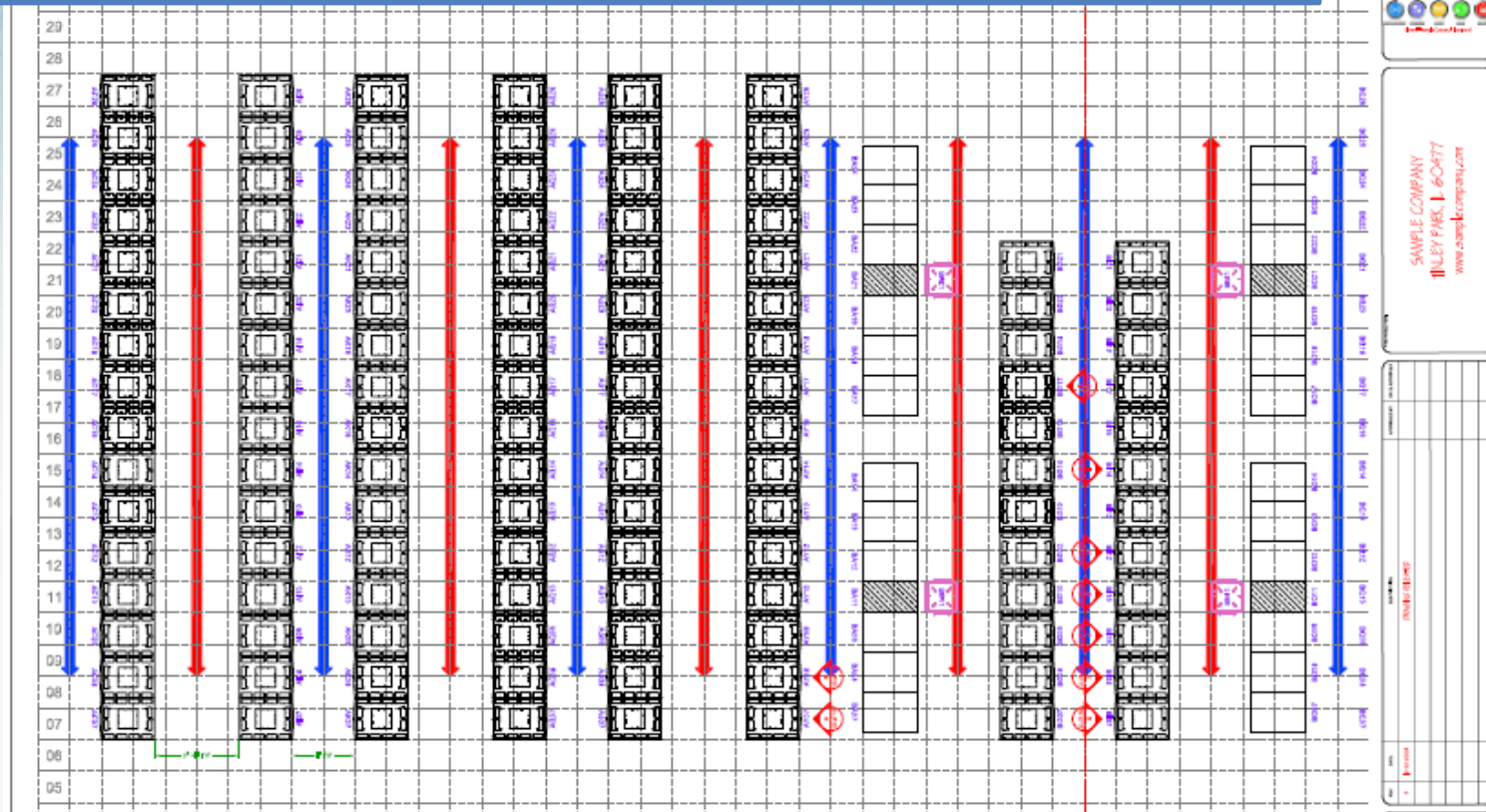


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# Phase 1 Deliverables – Space Planning

Space-planning layout that illustrates a plan view of the data center space defining the locations of racks, cabinets, aisle ways, CRAC/CRAH units, PDUs, RPPs, and all building structure elements that have an impact on the physical infrastructure layout



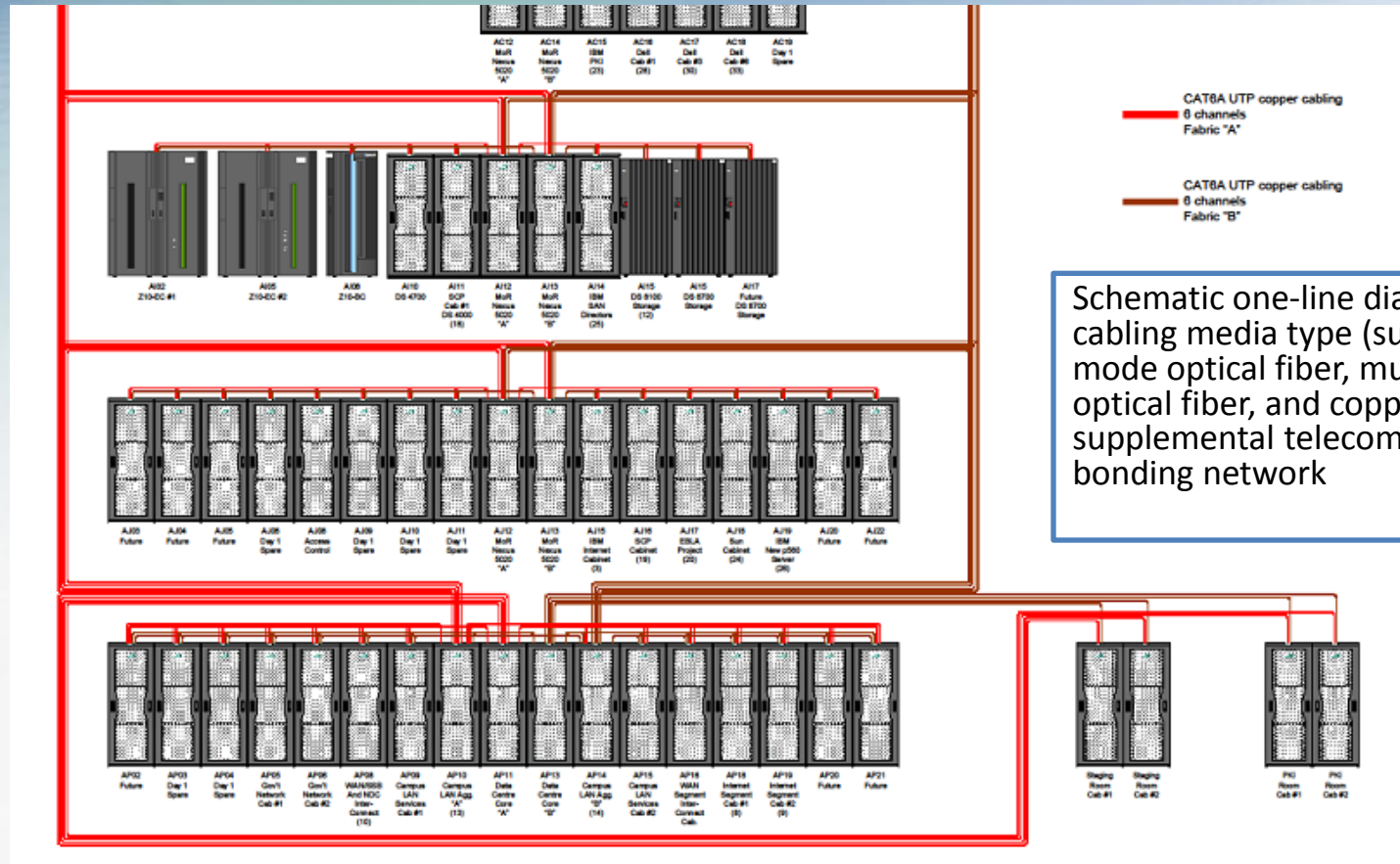
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# Phase 1 Deliverables – One-line Diagram



Schematic one-line diagrams for each cabling media type (such as single-mode optical fiber, multi-mode optical fiber, and copper) and the supplemental telecommunications bonding network

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# Cabling Considerations



PMD/Conn.	Cable Type	Power /Port	Latency/port	Reach	Standard
10G SFP+(CX1) cable assembly	Twinax 2 pair	<b>0.1 W</b>	0.1 us	15m	SFF-8431
X2 CX4 cable assembly	Twinax 8 pair	2 W	0.1 us	15m	802.3ak
SFP+ SR Duplex LC	MMF OM2 MMF OM3	2 W (incl. optics)	0.1 us	82m 300m	802.3ae
XFP SR Duplex LC	MMF OM2 MMF OM3	3 W (incl. optics)	0.1 us	82m 300m	802.3ae
X2 SR Duplex SC	MMF OM2 MMF OM3	4 W (incl. optics)	0.1 us	82m 300m	802.3ae
<b>10GBASE-T</b> RJ45	Cat6A UTP	<b>5.5 W</b>	2.5 us	100m	802.3an

Standards

Power

Design

Costs



# Datacenter Bonding & Grounding Implementation

**Under Floor**

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**Above the Rack**

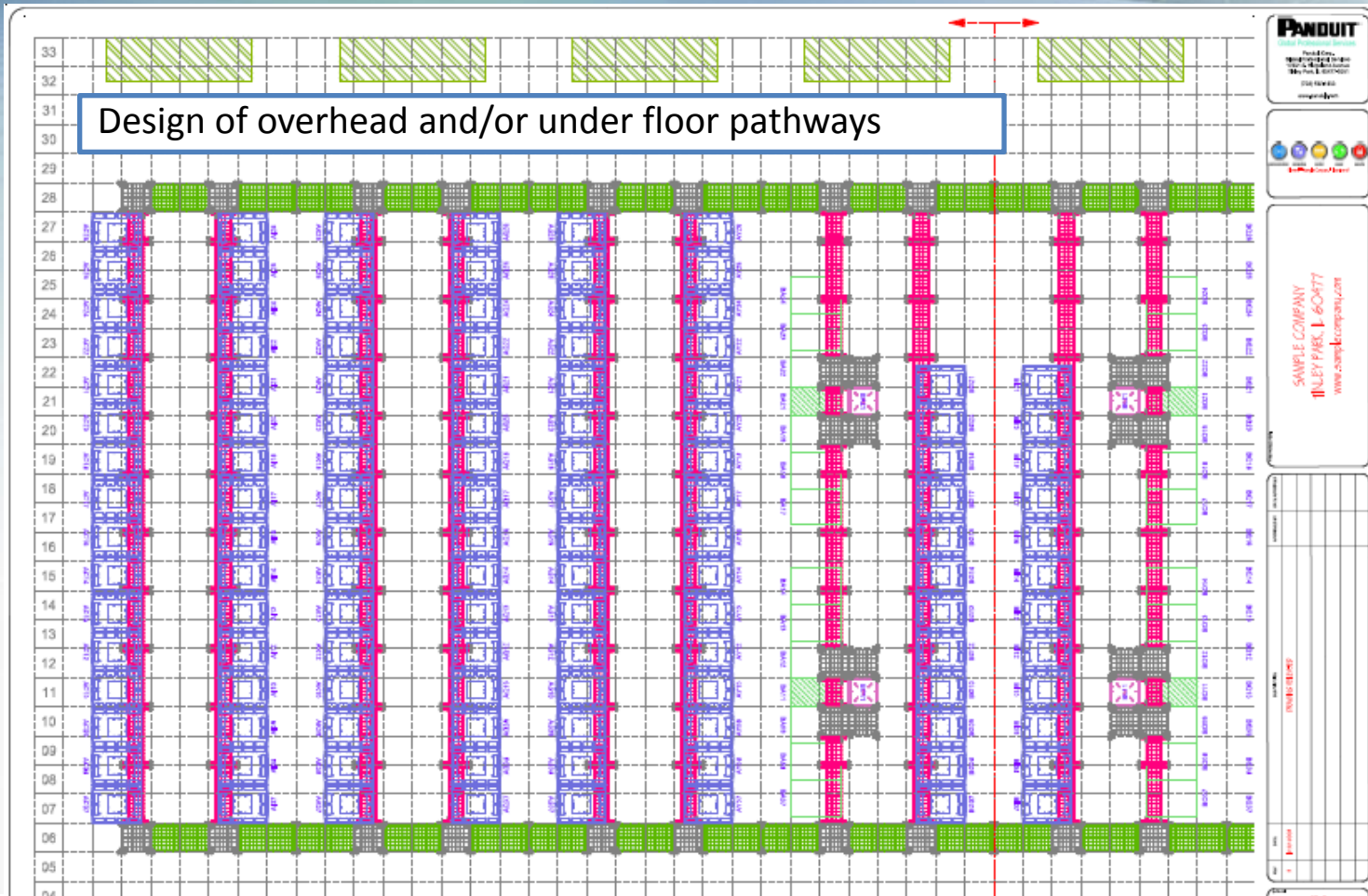
**STRUCTUREDGROUND™** System For Data Center Grounding  
Telecommunications Room

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# Phase 2 Deliverable – Pathway Design



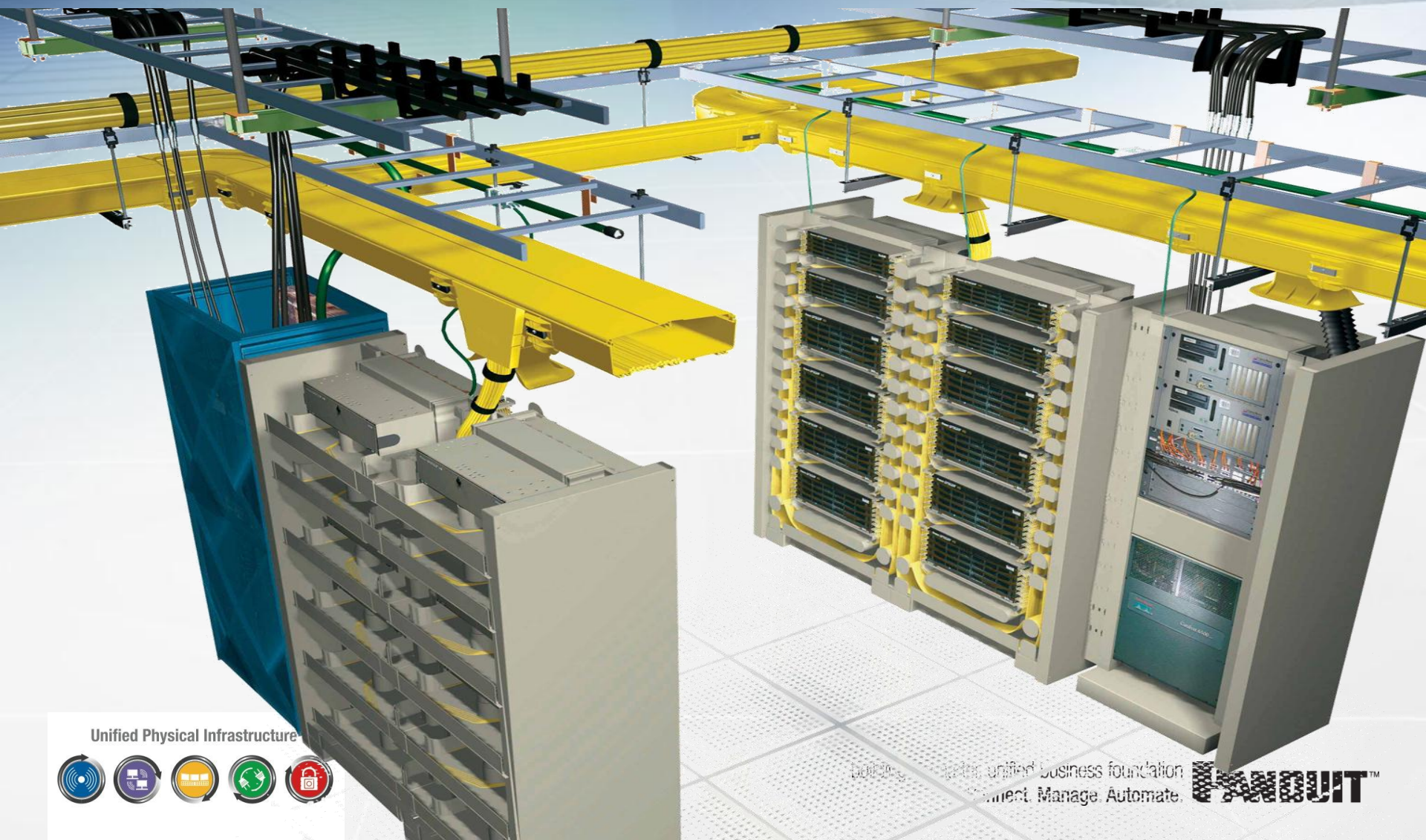
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# Pathway Options for fibre optic cable distribution



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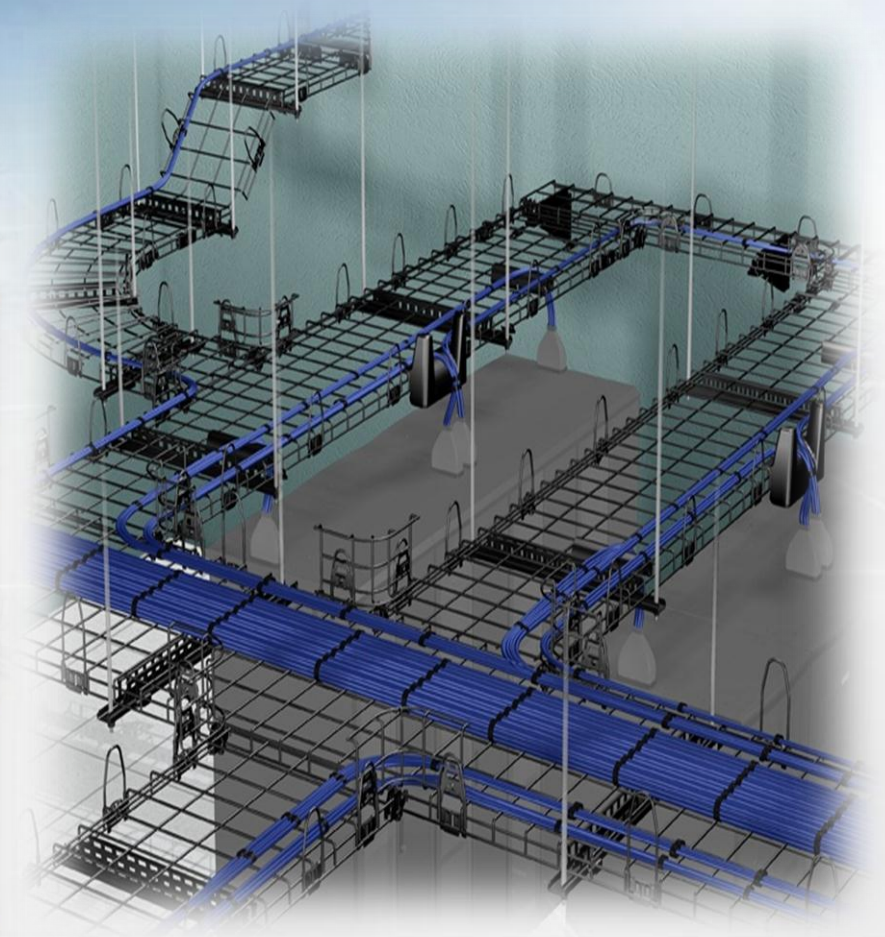
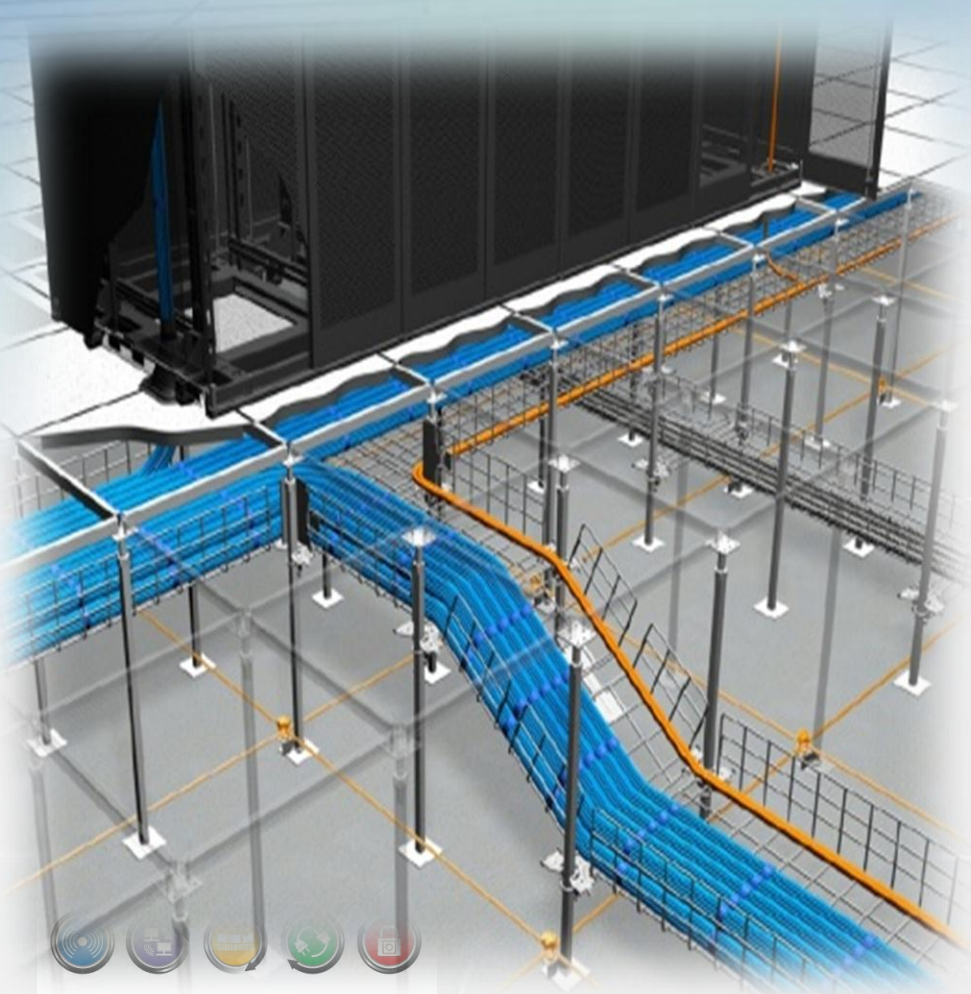
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# Pathway and cable management options

Under Floor

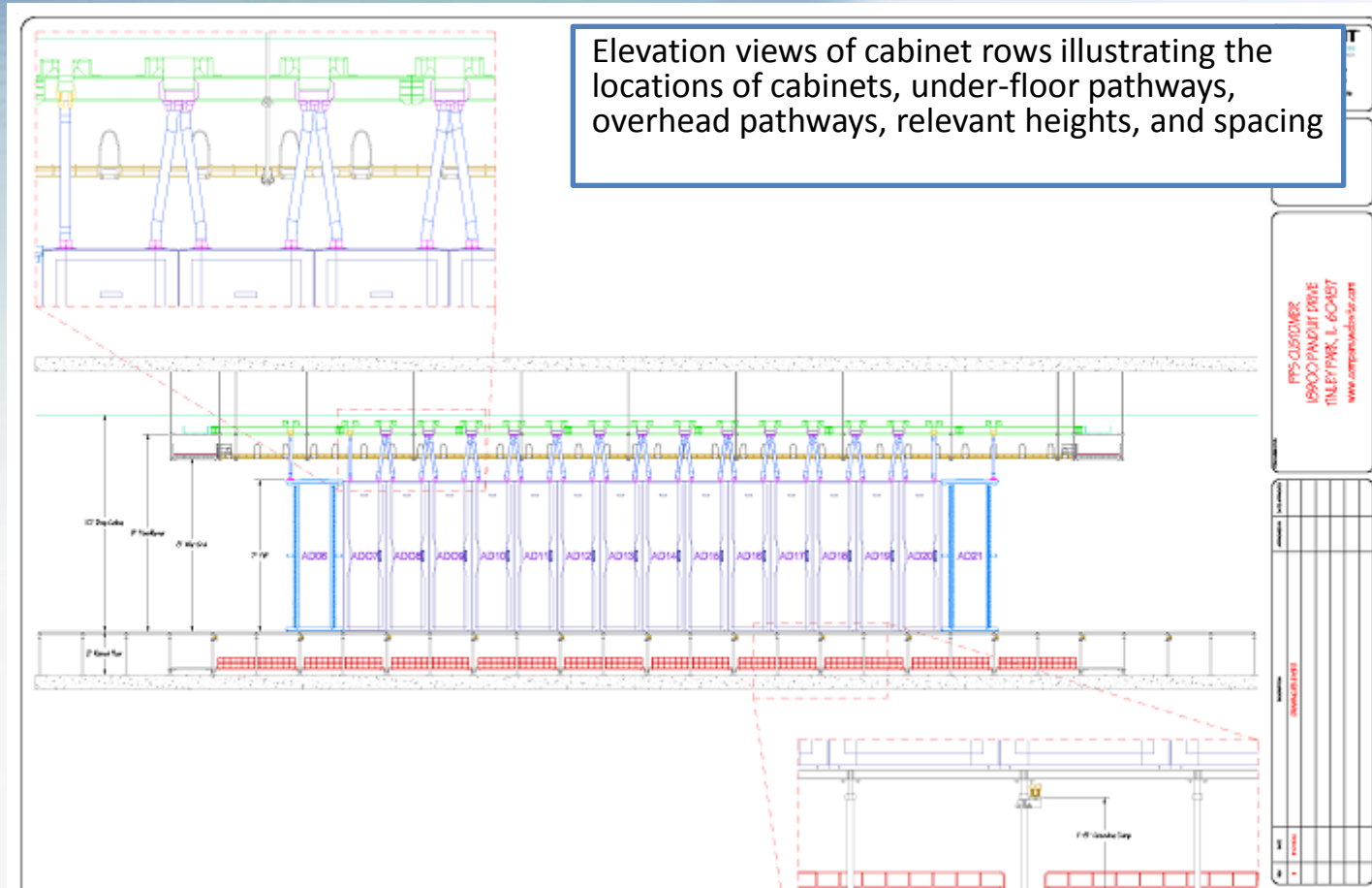
Above the Rack



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## Phase 2 Deliverables - Elevations



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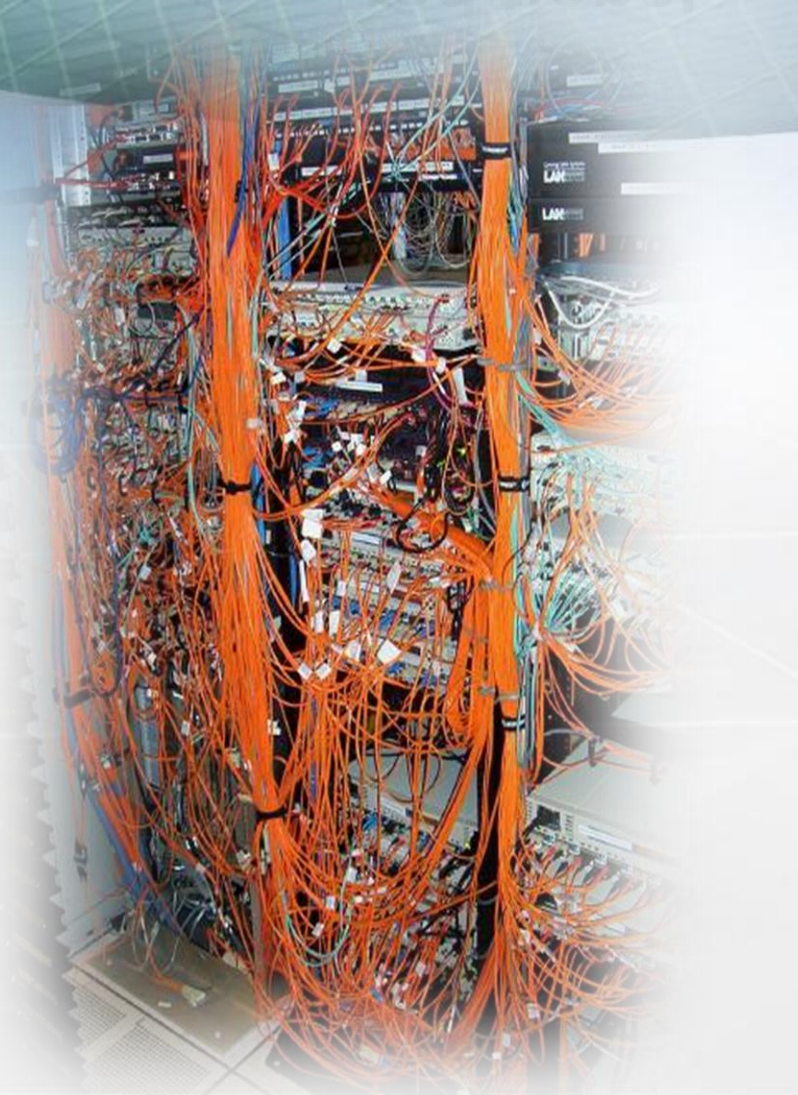
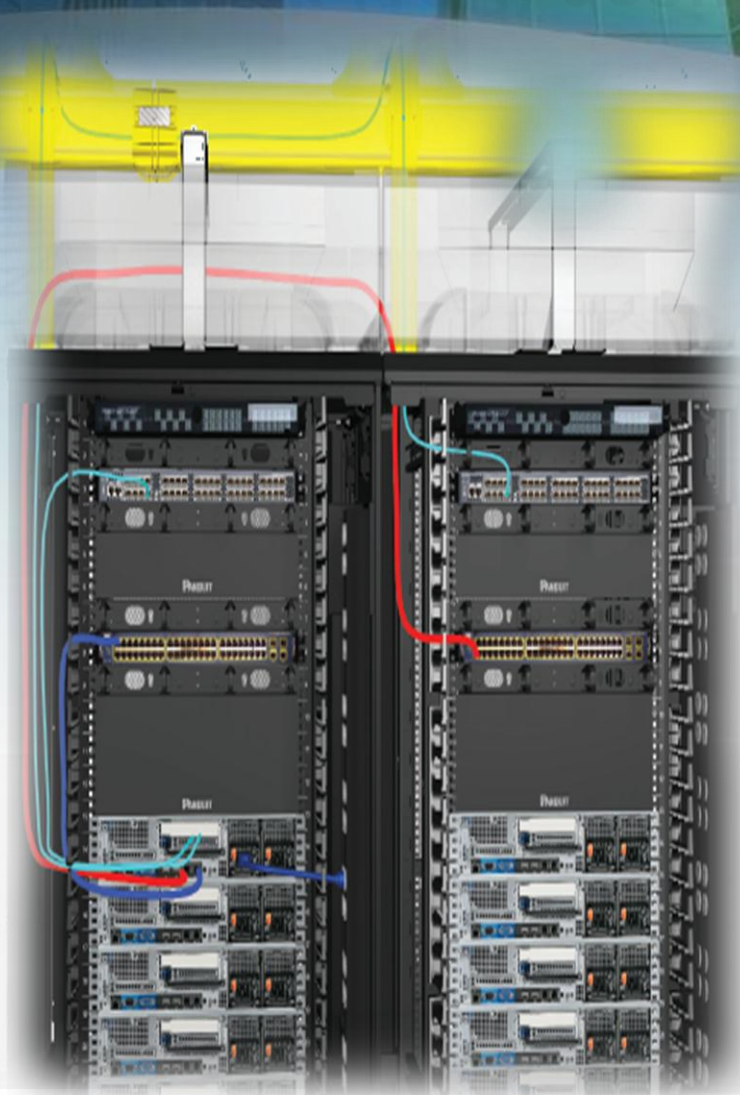


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# Top of Rack (ToR) design

# Traditional



Fabric

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# Phase 2 Deliverables – Rack Details

Rack-level elevation details of server, switch, storage, and patching cabinets



A ~~Detail~~ Rack (10) Access Switch Cabinet

B ~~Detail~~ Rack (10) Server Cabinet

C ~~Detail~~ Rack (10) Storage Cabinet

D ~~Detail~~ Rack (10) Core Switch Cabinet

E ~~Detail~~ Rack (10) Core Storage Cabinet

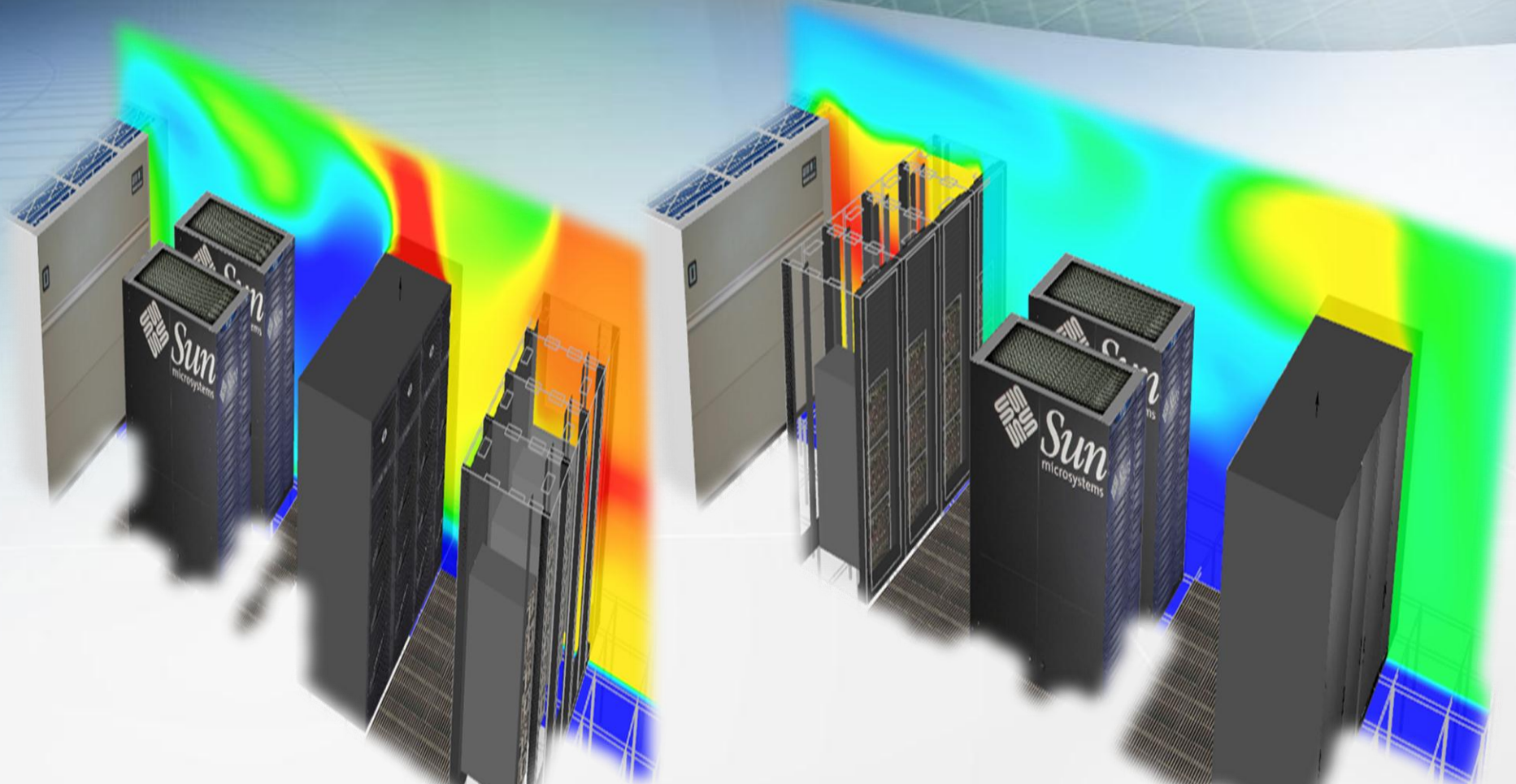


A vertical panel on the right side of the slide containing the PANDUIT logo at the top, followed by project information: "SAMPLE COMPANY", "12345 PINE ST.", "BOCA RATON, FL 33433", and "www.samplecompany.com". Below this is a table with multiple rows and columns, likely for a bill of materials or equipment list.

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# Deployment Matters



Same equipment, one works... one fails.

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# Phase 2 Deliverables - Specification

A technical specification following the Construction Specification Institute's (CSI) format:

- Sets forth requirements for products, materials or performance while adhering to industry standards and best practices
- Provide detailed information for an unbiased comparison of materials and products

**This in conjunction with our design drawings and Bill of Materials can be used at part of a bid documents package.**

The Corporation Anytown, USA	
SECTION 27 10 00 STRUCTURED CABLING SYSTEM	
PART 1 -	GENERAL
1.1	SUMMARY
A.	Section includes supply, delivery, supervision, coordination, installation of equipment items specified herein and shown on drawings as well as incorporation of Owner Furnished Equipment (OFE), testing, documentation, and instruction related to complete the Structured Cabling System.
1.	Products supplied but not installed under this section:
a.	Loose equipment specified herein which is to be turned over to the owner at the completion of this project.
b.	Bonding and grounding busbars as specified herein to be turned over to the Electrical Contractor for installation.
2.	Products installed but not supplied under this section:
a.	Owner Furnished Equipment
B.	Certain equipment may be identified as Owner Furnished Equipment (OFE). This may presently be part of the Owner's system, or will be provided by the Owner, and will be delivered to Contractor's off-site construction facility, delivered to the Contractor's on-site secured storage area, or installed on-site by others, as appropriate, for incorporation into the system.
1.	Clean and inspect all OFE, and notify the Owner in writing of damage or defect and the extent of repair and/or adjustment required to bring the OFE to original specification. Service OFE only as directed by the Owner under the arrangements of a separate contract.
a.	Incorporate into the system as if provided new, excepting warranty coverage.
C.	Related Drawings
1.	T-Series drawings correspond to this section.
D.	Furnish and install telecommunications passive equipment, including:
1.	Horizontal cable.
2.	Backbone cable.
3.	Termination hardware.
4.	Communications outlets.
5.	Intersystem connections.
6.	Device connections.
7.	Splicing and terminations.
8.	Testing.
9.	Administration.
E.	Although such work is not specifically mentioned herein or on the drawings, the contractor shall furnish and install all miscellaneous items, accessories, appurtenances and devices incidental to or necessary for a sound, secure and complete installation, without claim for additional payment.
F.	Provide system testing and demonstration, system documentation and instruction of Owner Personnel without claim for additional payment.
G.	If any errors or omissions appear in Drawings, Specifications, or other documents, bidding Contractor shall notify Engineer no later than ten (10) days prior to submitting bid. Should conflict occur in or between drawings and specifications, bidding contractor is deemed to have estimated the more expensive way of doing the work, unless he/she has asked for and

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# Phase 2 Deliverables – Cabling Schedules

## Detailed Cabling Schedules

- Simplified ordering with exact part numbers
- Reduce waste with customized cable lengths
- Speed implementation with to/from cable details

ITEM	PATHWAY ROUTING	MEDIA TYPE	CHANNEL COUNT	FROM	TO	LENGTH	PANDUIT PART NUMBER
69	C	10Gig OM4	12	IXF3:L05	IXF5:F05	20m	FZ12D5-5M20Y
70	C	10Gig OM4	12	IXF3:L06	IXF5:F06	20m	FZ12D5-5M20Y
71	C	10Gig OM4	12	IXF3:L07	IXF5:F07	20m	FZ12D5-5M20Y
72	C	10Gig OM4	12	IXF3:L08	IXF5:F08	20m	FZ12D5-5M20Y
73	C	10Gig OM4	12	IXF3:W01	ZDF1:F01	30m	FZ12D5-5M30Y
74	C	10Gig OM4	12	IXF3:W02	ZDF1:F02	30m	FZ12D5-5M30Y
75	C	10Gig OM4	12	IXF3:W03	ZDF1:F03	30m	FZ12D5-5M30Y
76	C	10Gig OM4	12	IXF3:W04	ZDF1:F04	30m	FZ12D5-5M30Y
77	C	10Gig OM4	12	IXF3:W05	ZDF1:F05	30m	FZ12D5-5M30Y
78	C	10Gig OM4	12	IXF3:W06	ZDF1:F06	30m	FZ12D5-5M30Y
79	C	10Gig OM4	12	IXF3:W07	ZDF1:F07	30m	FZ12D5-5M30Y
80	C	10Gig OM4	12	IXF3:W08	ZDF1:F08	30m	FZ12D5-5M30Y
81	C	10Gig OM4	12	IXF3:X01	ZDF2:F01	25m	FZ12D5-5M25Y
82	C	10Gig OM4	12	IXF3:X02	ZDF2:F02	25m	FZ12D5-5M25Y
83	C	10Gig OM4	12	IXF3:X03	ZDF2:F03	25m	FZ12D5-5M25Y

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 www.safetysupply.com

ITEM	PATHWAY ROUTING	MEDIA TYPE	CHANNEL COUNT	FROM	TO	LENGTH	PANDUIT PART NUMBER
69	C	10Gig OM4	12	IXF3:L05	IXF5:F05	20m	FZ12D5-5M20Y
70	C	10Gig OM4	12	IXF3:L06	IXF5:F06	20m	FZ12D5-5M20Y
71	C	10Gig OM4	12	IXF3:L07	IXF5:F07	20m	FZ12D5-5M20Y
72	C	10Gig OM4	12	IXF3:L08	IXF5:F08	20m	FZ12D5-5M20Y
73	C	10Gig OM4	12	IXF3:W01	ZDF1:F01	30m	FZ12D5-5M30Y
74	C	10Gig OM4	12	IXF3:W02	ZDF1:F02	30m	FZ12D5-5M30Y
75	C	10Gig OM4	12	IXF3:W03	ZDF1:F03	30m	FZ12D5-5M30Y
76	C	10Gig OM4	12	IXF3:W04	ZDF1:F04	30m	FZ12D5-5M30Y
77	C	10Gig OM4	12	IXF3:W05	ZDF1:F05	30m	FZ12D5-5M30Y
78	C	10Gig OM4	12	IXF3:W06	ZDF1:F06	30m	FZ12D5-5M30Y
79	C	10Gig OM4	12	IXF3:W07	ZDF1:F07	30m	FZ12D5-5M30Y
80	C	10Gig OM4	12	IXF3:W08	ZDF1:F08	30m	FZ12D5-5M30Y
81	C	10Gig OM4	12	IXF3:X01	ZDF2:F01	25m	FZ12D5-5M25Y
82	C	10Gig OM4	12	IXF3:X02	ZDF2:F02	25m	FZ12D5-5M25Y
83	C	10Gig OM4	12	IXF3:X03	ZDF2:F03	25m	FZ12D5-5M25Y



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# Pre-terminated copper and fiber, pre-tested connectivity

Minimising risk

Focusing on the design

Quick and easy deployment



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# Phase 2 Deliverables - BOM

## Detailed Bill of Materials

- Specifies all components in Design
- Reduces procurement time

**PANDUIT® Bill of Material**

Job Name: Panduit Corp. Date: 01/01/12  
 Job Location: Burr Ridge, IL Bid Date:   
 BOM Title: Telecommunication Room Refresh By: [someone@panduit.com](mailto:someone@panduit.com)

Panduit Corp. assumes no obligation or liability for the accuracy of the information contained on this Bill of Material. In creating this Bill of Material, Panduit entirely relied upon the drawings and specifications that the customer supplied to Panduit. The appropriate material, quantities and weights for the project should be verified by an installer. Customer is responsible for determining the suitability of the products for the intended use and customer assumes all risk and liability whatsoever in connection therewith. Applicable components are shown to the nearest purchasable quantity.

Part Number	Description	Qty.	Units
<b>Closet A (BR-1A)</b>			
R4P	4 Post Rack - 45 RU, 30" depth, threaded rails	1	PC
R4PWF	PatchRunner Vertical Cable Manager Top Waterfall	1	PC
PEV8	PatchRunner High Capacity Vertical Cable Manager - 7' height, 8" width	2	PC
PEDB	PatchRunner High Capacity Vertical Cable Manager Dual Hinge Door - 7' height, 8" width	2	PC

Part Number	Description	Qty.	Units
<b>Closet A (BR-1A)</b>			
R4P	4 Post Rack - 45 RU, 30" depth, threaded rails	1	PC
R4PWF	PatchRunner Vertical Cable Manager Top Waterfall	1	PC
PEV8	PatchRunner High Capacity Vertical Cable Manager - 7' height, 8" width	2	PC
PEDB	PatchRunner High Capacity Vertical Cable Manager Dual Hinge Door - 7' height, 8" width	2	PC
PRSP7	PatchRunner Slack Spool - 7" length, front only	8	PC
PEV8RC8	PatchRunner High Capacity Vertical Cable Manager Horizontal Cross Brace Bend Radius Control	2	PC
PEVEP	PatchRunner High Capacity Vertical Cable Manager End Panel	2	PC
PVQ-MIQAPU24	PanView IQ Angled Patch Panel - 24-port, 1 RU	16	PC
PVQ-PM	PanView IQ Intelligence Module - Panel Manager	4	PC
PVQ-EM	PanView IQ Intelligence Module - Expansion Module	12	PC
PVQ-PS12VDC-S	PanView IQ Power Supply - 30W, North America	4	PC
CPAF28LY	Rack Mount Angled Filler Panel - 2 RU	1	PC
DPEP1	Rack Mount Filler Panel - 1 RU	1	PC
DPEP2	Rack Mount Filler Panel - 2 RU	1	PC
NMF2	NetManager High Capacity Horizontal Cable Manager - 2 RU, front only	1	PC
WG12BL10	Wyr-Grid 12" Overhead Cable Tray	20	FT
WG18BL10	Wyr-Grid 18" Overhead Cable Tray	10	FT
WGINTSPLBL	Wyr-Grid Intersction Splice Connector	2	PC
WG8TMWFBL	Wyr-Grid Bottom Waterfall	4	PC

Date: 01/01/12  
 Bid Date:   
 By: [someone@panduit.com](mailto:someone@panduit.com)

igned on this Bill of Material. In creating this Bill of Material, Panduit fully. The appropriate material, quantities and weights for the project of the products for the intended use and customer assumes all risk ets are shown to the nearest purchasable quantity.

Qty.	Units
1	PC
1	PC
2	PC
2	PC
8	PC
2	PC
2	PC
28	PC
4	PC
12	PC
4	PC
1	PC
1	PC
1	PC
20	FT
10	FT
2	PC
4	PC
2	PC
2	PC
4	PC
1	PC
3	PC
12	PC
3	PC
2	PC
4	PC
1	PC
3	PC
1	PC

**Bill of Material**

Date: 01/01/12  
 Bid Date:   
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1	PC
20	FT
10	FT
2	PC
4	PC
2	PC
2	PC
4	PC
1	PC
3	PC
12	PC
3	PC
2	PC
4	PC
1	PC
3	PC
1	PC

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Qty.	Units
1	PC
1	PC
2	PC
8	PC
2	PC
2	PC
28	PC
4	PC
12	PC
4	PC
1	PC
1	PC
20	FT
10	FT
2	PC
4	PC
2	PC
2	PC
4	PC
1	PC
3	PC
12	PC
3	PC
2	PC
4	PC
1	PC
3	PC
1	PC



# Phase 2 : 3D modelling using ICE software



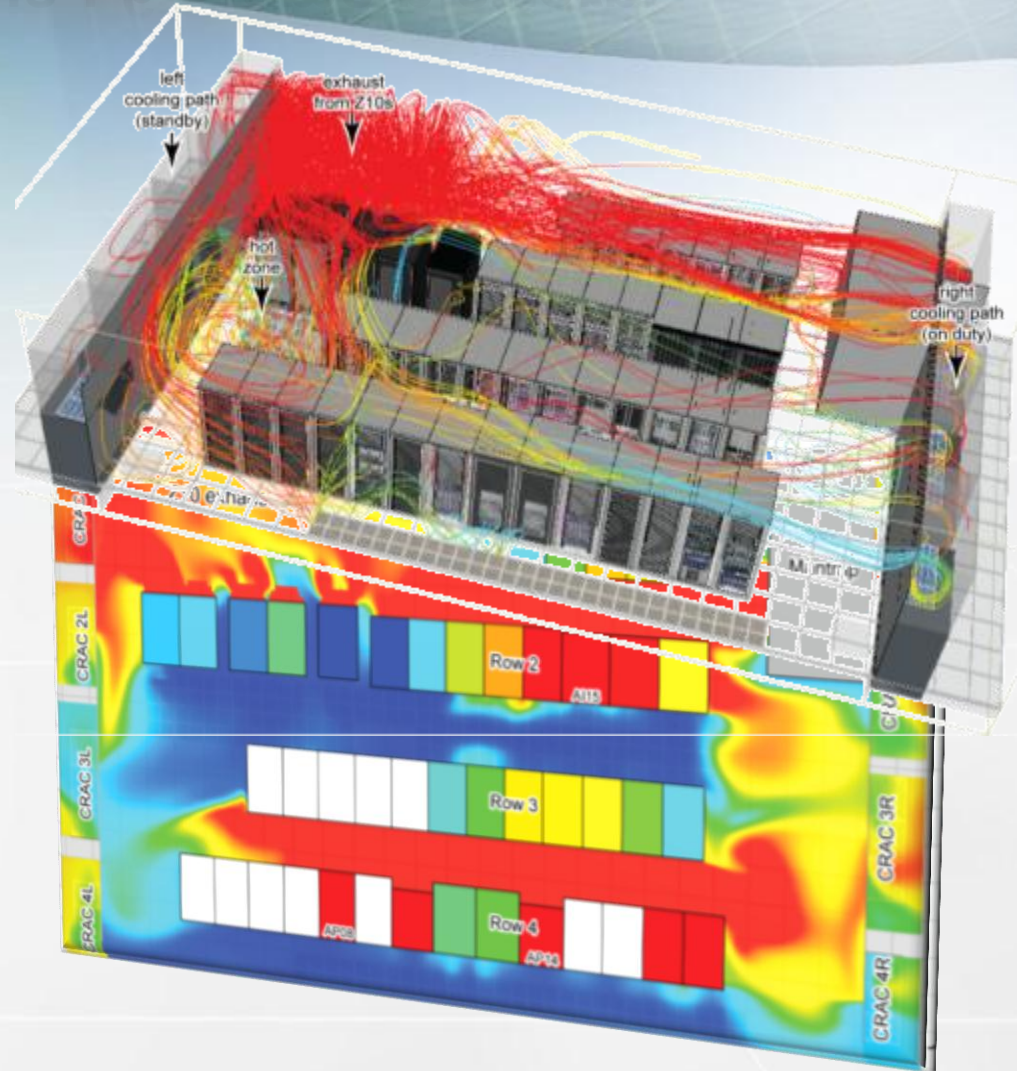
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# Phase 3 : Predictive Thermal Assessment with CFD analysis : 6 Sigma platform

- Simulate the operation of the future datacenter
- Optimize data center cooling design to reduce CapEX & OpEx costs.
- Understand the future thermal behavior of the hardware and take corrective design decisions
- Identify airflow issues before the datacenter construction
- Evaluate individual cabinet thermal behavior
- Tiles selection & positioning or containment pressure etc



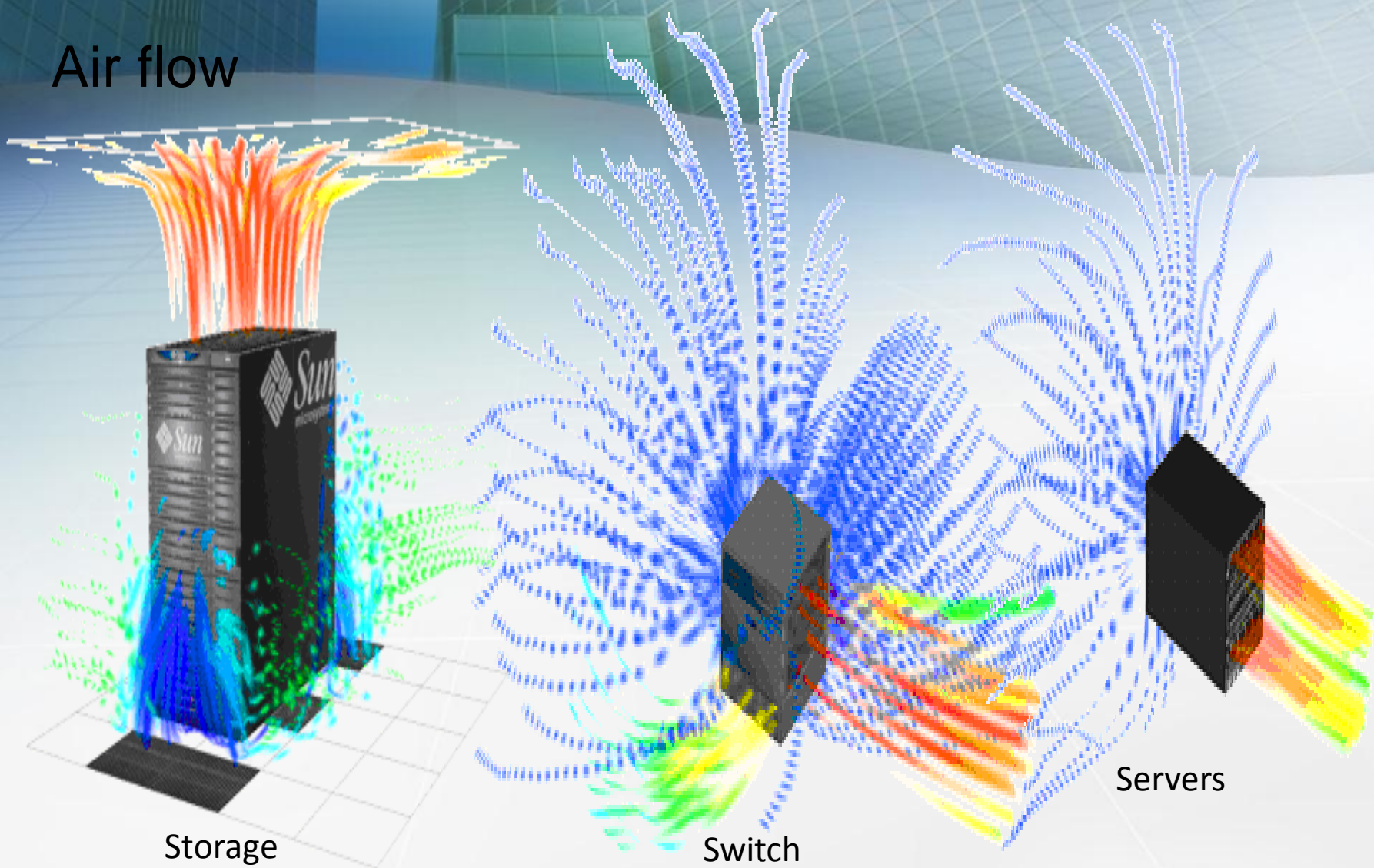
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Air flow



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# Phase 4 : Physical Infrastructure Management

## On line asset tracking and management



The Physical Infrastructure Manager™ (PIM™) Software platforms for Data Centers and Enterprise track the allocation and utilization of critical IT assets and networking resources, as well as power consumption and environmental within your data center and remote sites, from anywhere in the world.



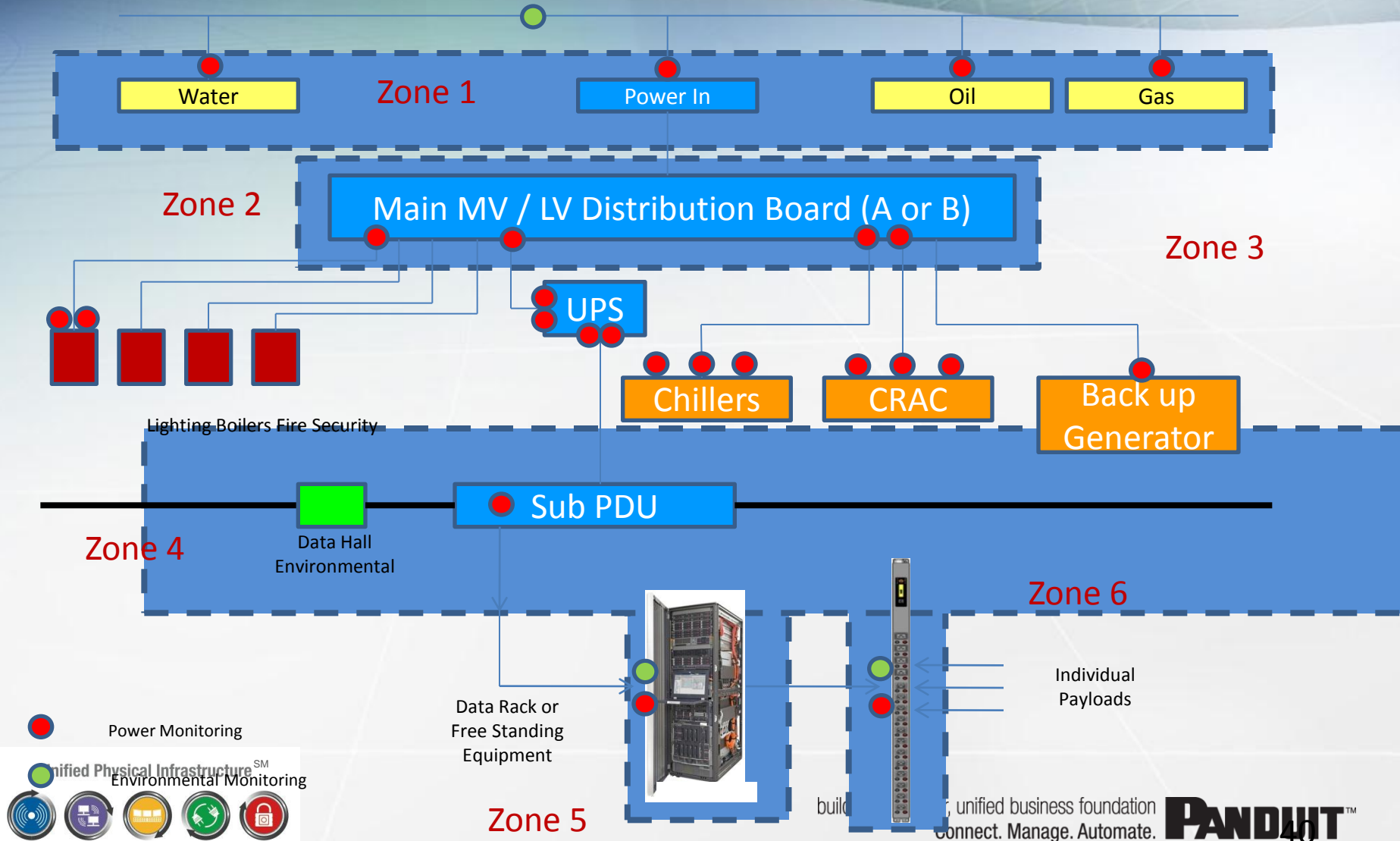
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# Phase 5 : 6 Zone Datacenter Management

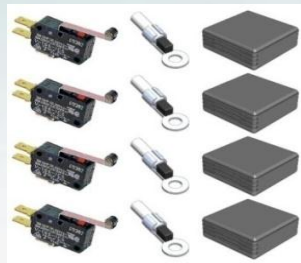




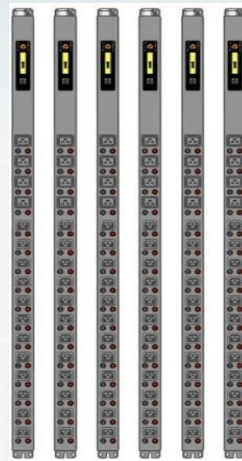
# Energy Management & Environmental Monitoring Solution



4x Outputs



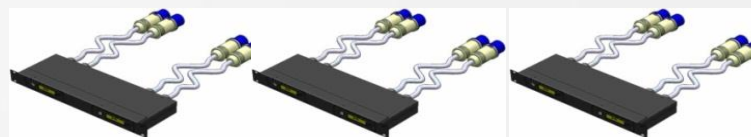
12x Sensors



LCD Status Display



2 x Keypad or 2 x Card Reader



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# Phase 6 : On site assessment on the real datacenter

- DCIM can now provide real data
- **CFD can perform analysis and support changes especially in a hosting environment**
- Historical energy data, asset utilization information are now available to facilitate capacity planning
- **Corrective actions with fully predicted effect**



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# 6. Summary

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# Verified Sustainable Value & Return on Investment

## Panduit Capabilities



## Customer Benefits

- **Up to 10%** more useable space
- **Up to 15%** reduction in power
- **Up to 40%** reduction in cooling costs
- **Up to 80%** reduction in change management time
- **Up to 75%** reduction in time to install

Availability/  
Uptime

Physical  
Security/Safety

Agility/  
Responsiveness

Energy/  
Sustainability

Space/Density

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# More exciting news to come in September 2013

**Powering** Transformation



**16-18 SEPT 2013. MALTA**

**You are welcome at our Customer Briefing Centers in Europe through the year**



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Q.

