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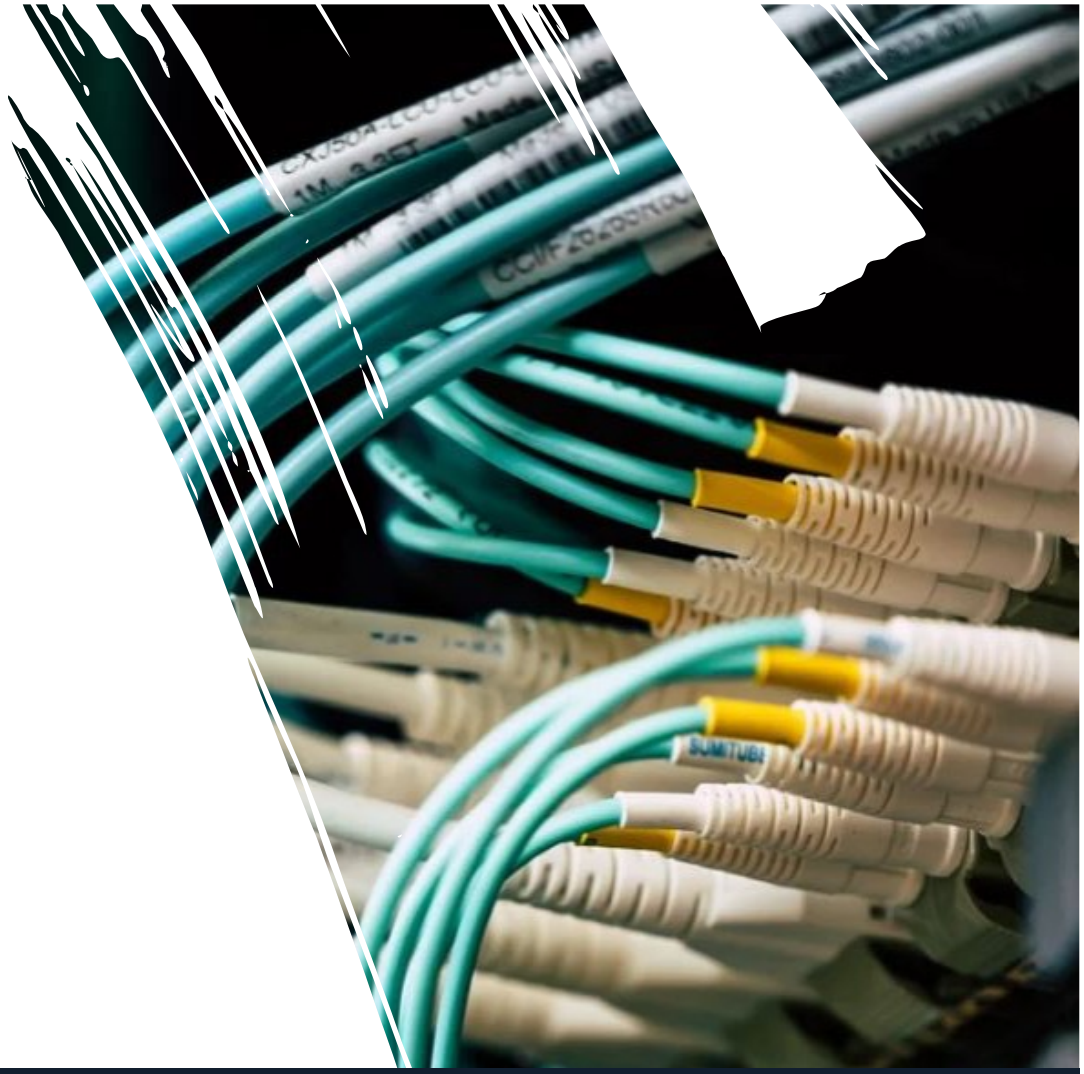
Malaysia Network Operators Group

BUILDING SCALABLE NETWORKS WITH

FLEXIBLE OPEN LINE DWDM SYSTEMS

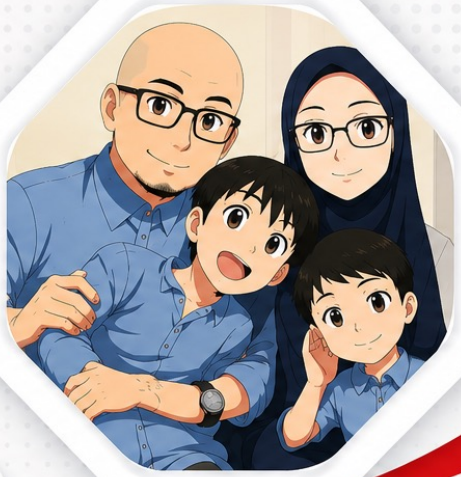


ABOUT ME

Entrepreneur | Network Engineer

A Father of 2 Minions &
A Husband to Wonderful Wife

Founder & Managing Director of
X86 Network Sdn. Bhd.



X86 is a Malaysian based connectivity service provider with focus on domestic & regional connectivity services specifically on

Data Centre Interconnect (DCI),
Dedicated Internet Access, and **Ethernet Private Line (EPL).**

Data Centre Interconnect (DCI)	Dedicated Internet Access	Ethernet Private Line (EPL)

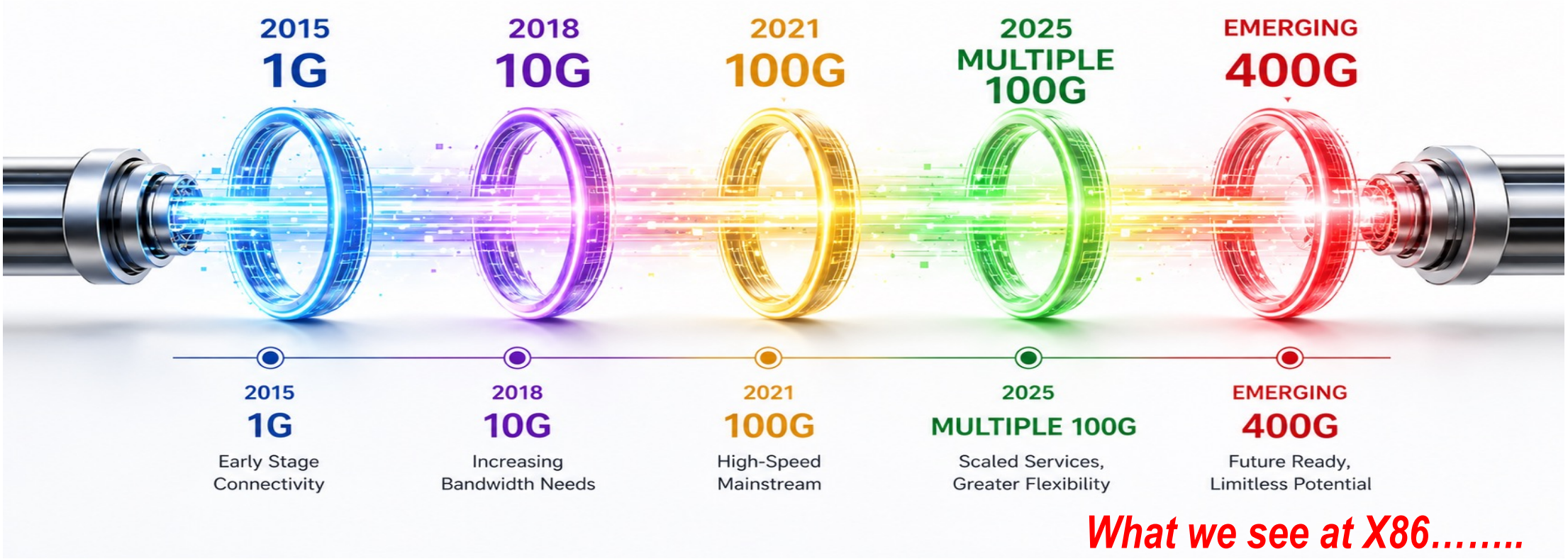
X86 NETWORK
powered by smartoptics

BUILDING SCALABLE NETWORK with

FLEXIBLE OPEN LINE DWDM SYSTEM

Why this TOPIC?

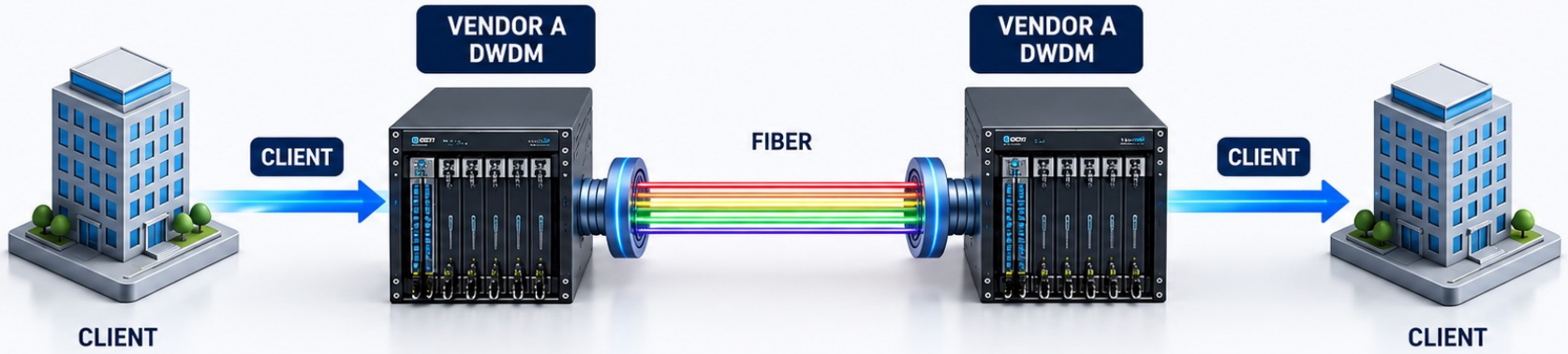
THE BANDWIDTH EXPLOSION



What we see at X86……..

and how do we scale transport capacity without scaling costs at the same rate?

TRADITIONAL DWDM APPROACH



CHARACTERISTICS

- ✓ Single-vendor support
- ✓ Simplified procurement
- ✗ Vendor lock-in
- ✗ Expensive upgrades
- ✗ Limited interoperability
- ✗ Long refresh cycles

TYPICAL QUESTION

"Do I need to buy another full DWDM system just to deliver one additional 100G service?"


Deploying Open Line DWDM Network
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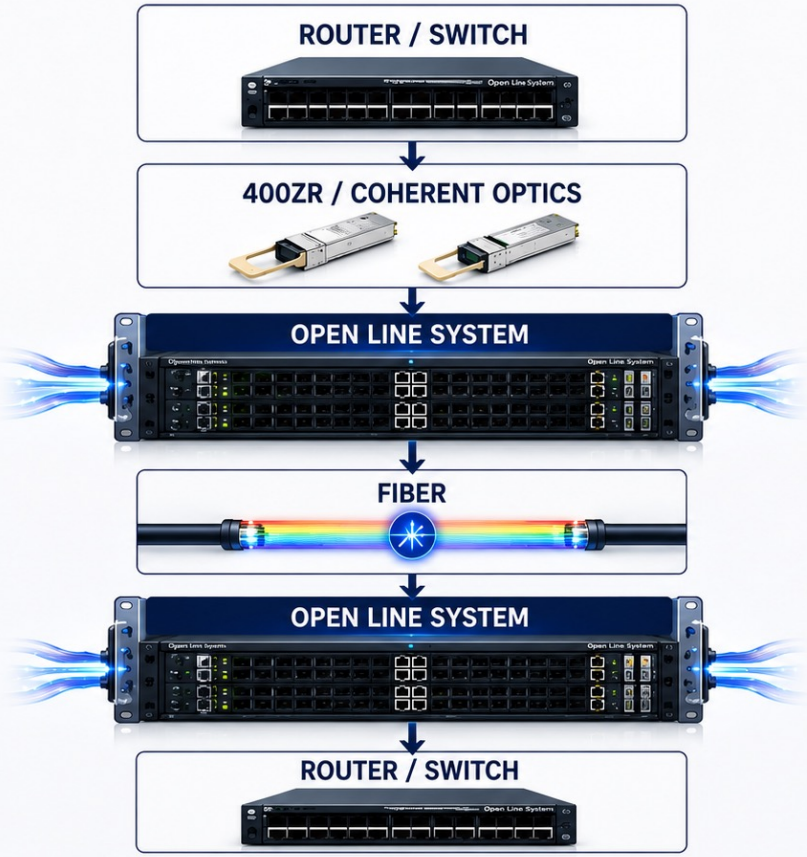
OPEN LINE SYSTEM ARCHITECTURE



COMPONENTS

MUX/DEMUX
Add / Drop
Multiple Wavelengths

EDFA
Erbium Doped
Fiber Amplifier

ROADM
Reconfigurable
Add / Drop Multiplexer

OSC
Optical Supervisory
Channel

OCM
Optical Channel
Monitor

FIBER MONITORING
Real-time Performance
& Fault Monitoring

Decoupling Optical Transport

KEY IDEA

Transport becomes **independent** from transponder hardware.

OPEN OPTICAL NETWORK EXAMPLE

DESIGN GOALS

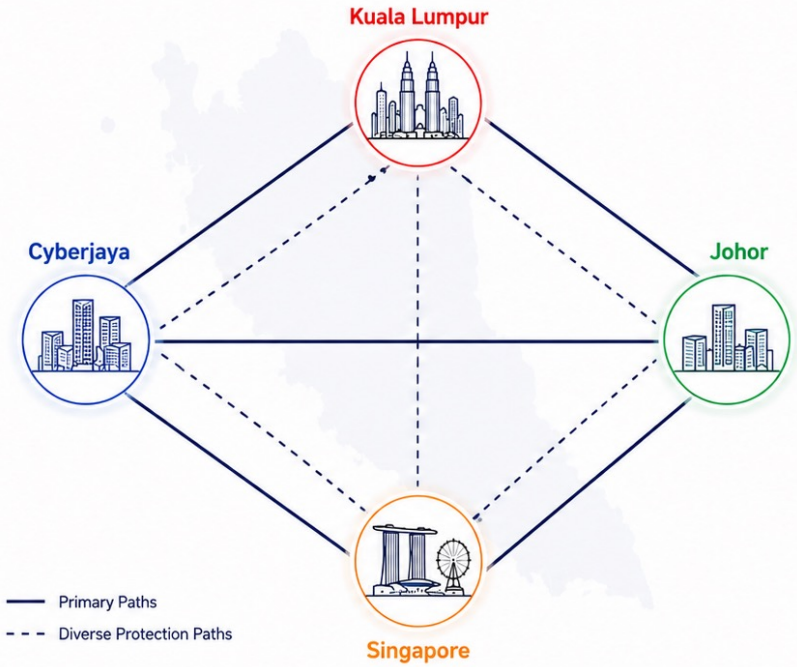
Route Diversity
Multiple diverse paths between every site

Multi-Site Resiliency
Resilient by design across all locations

Incremental Growth
Scalable capacity to support future demand

Layer-1 Protection
Optical layer protection with fast failover

Layer-2 Restoration
Service continuity with intelligent restoration



SERVICES RIDING THE NETWORK

DCI
Data Centre Interconnect

EPL
Ethernet Private Line

DIA
Dedicated Internet Access

Cloud Connectivity
Seamless access to cloud platforms

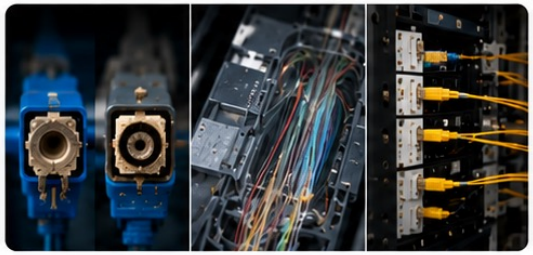
BUILT USING OPEN LINE DWDM NETWORK

Open. Disaggregated. Interoperable.

Challenges

THE REALITY OF OPTICAL DEPLOYMENTS

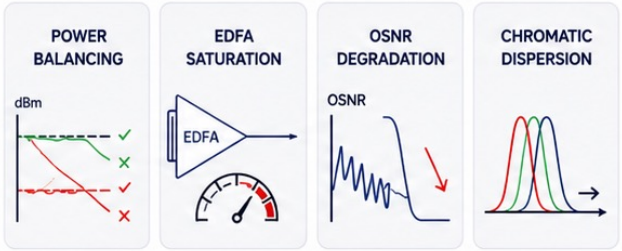
FIBER ISSUES



- Poor splice quality
- Legacy routes
- Dirty connectors
- Excessive patching

Physical layer problems create unpredictable network behavior

OPTICAL ISSUES



- Power balancing
- EDFA saturation
- OSNR degradation
- Chromatic dispersion

Optical impairments reduce performance and limit capacity

OPERATIONAL ISSUES

- Multi-vendor interoperability
- Limited field expertise
- Troubleshooting complexity

Operational gaps slow down resolution and increase MTTR

Great networks are not just designed well. They are built right, tested thoroughly, and operated with deep visibility.

OPTICAL PLATFORM SELECTION

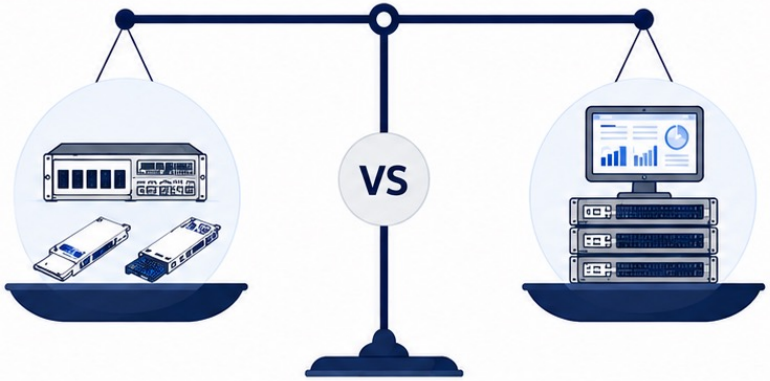
Understanding the Trade-Offs

Different Operators Optimize for Different Outcomes
There is no perfect DWDM vendor.

OEM / Whitebox DWDM

- Lower CAPEX
- Faster Deployment
- Open Networking Flexibility

- Higher Validation Effort
- Vendor-Dependent Ecosystem
- Limited Training Resources



Established Optical Vendor

- Mature Software
- Structured TAC Support
- Proven Interoperability
- Broad Partner Ecosystem

- Higher CAPEX
- Longer Procurement Cycle

What Operators Prioritize Differently

Cost Optimization
Minimize CAPEX and total cost

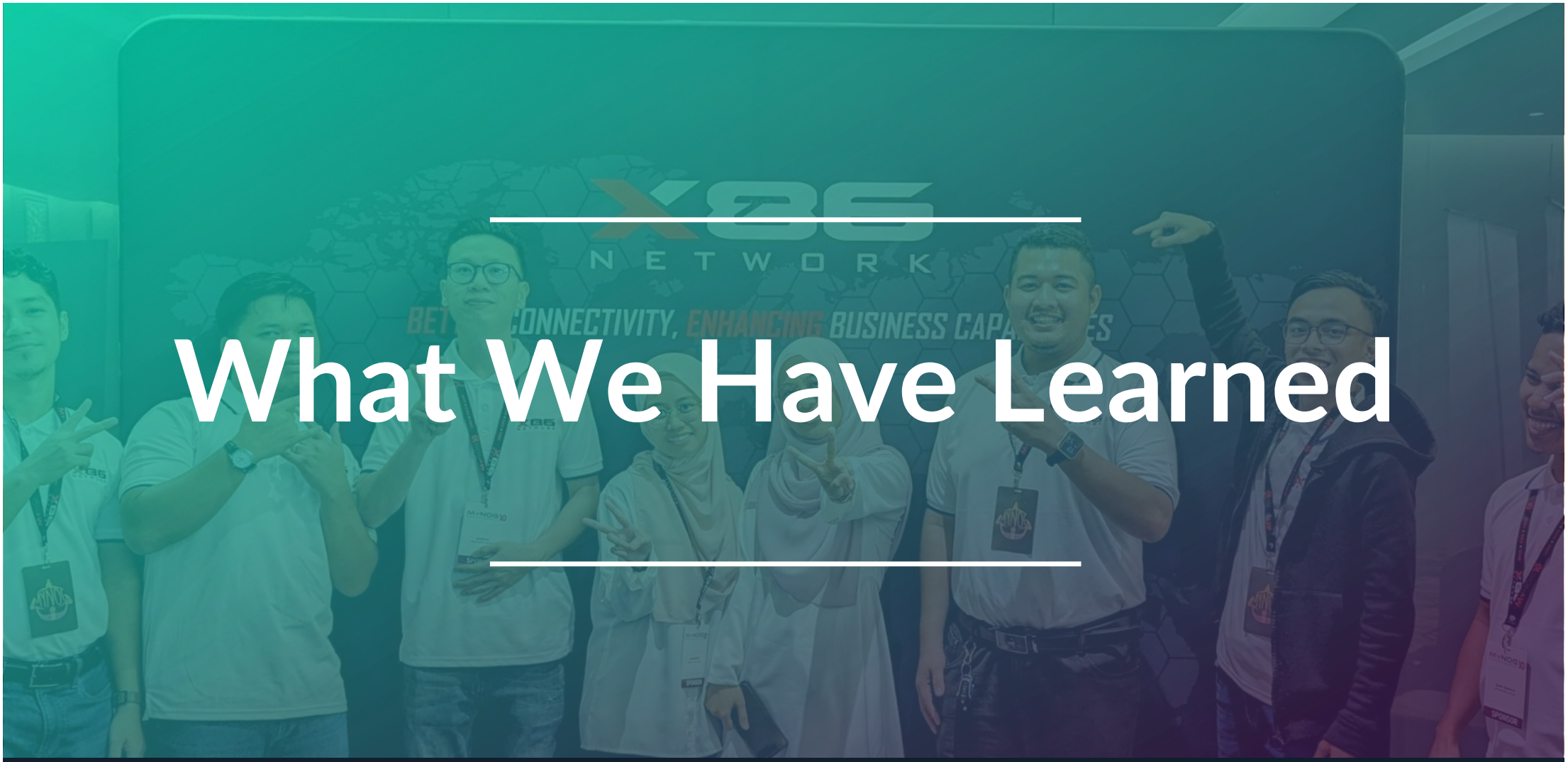
Operational Simplicity
Reduce complexity and effort

Open Networking
Flexibility and freedom of choice

Long-Term Support
Reliability, lifecycle, and sustainability

The right platform is not determined by the vendor.
It is determined by your operational model, engineering capability, and business objectives.

There is no universal "best" DWDM platform.
There is only the platform that best matches your network, team, and growth strategy.



What We Have Learned

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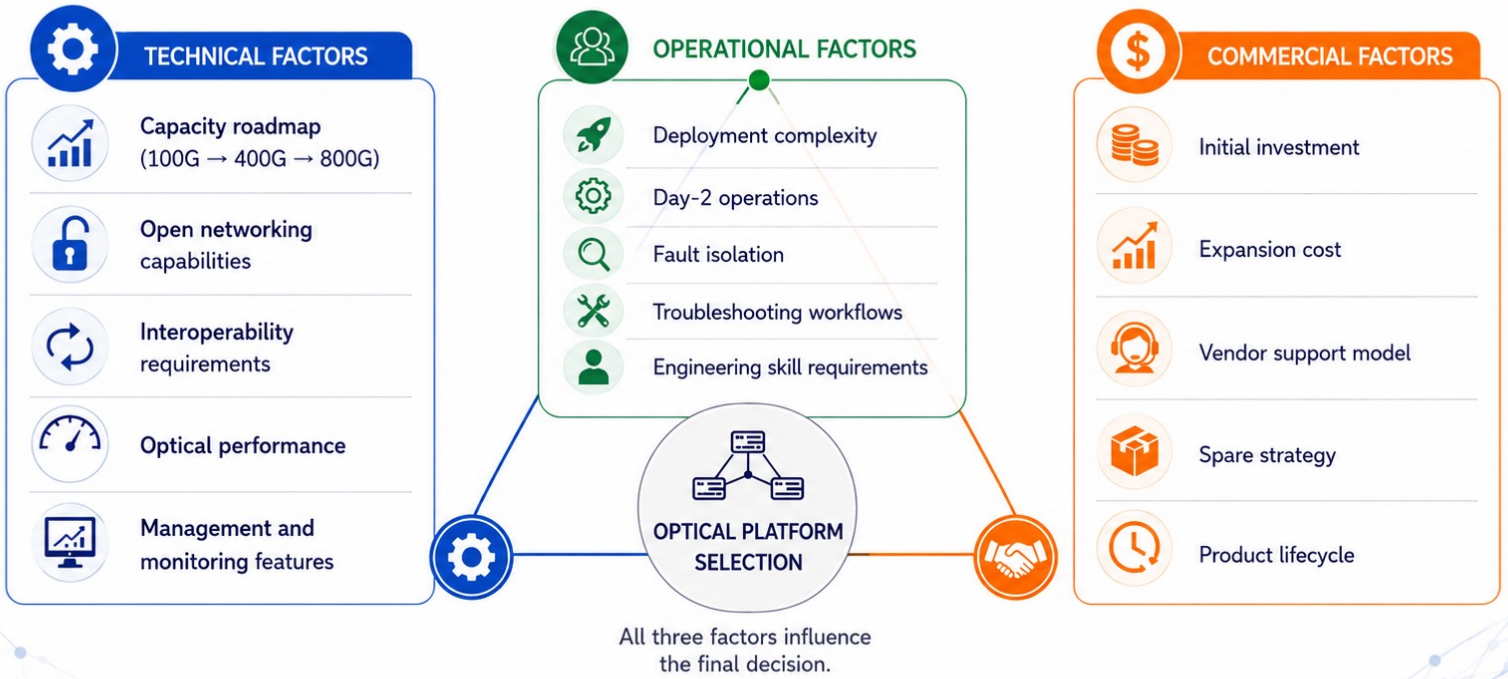
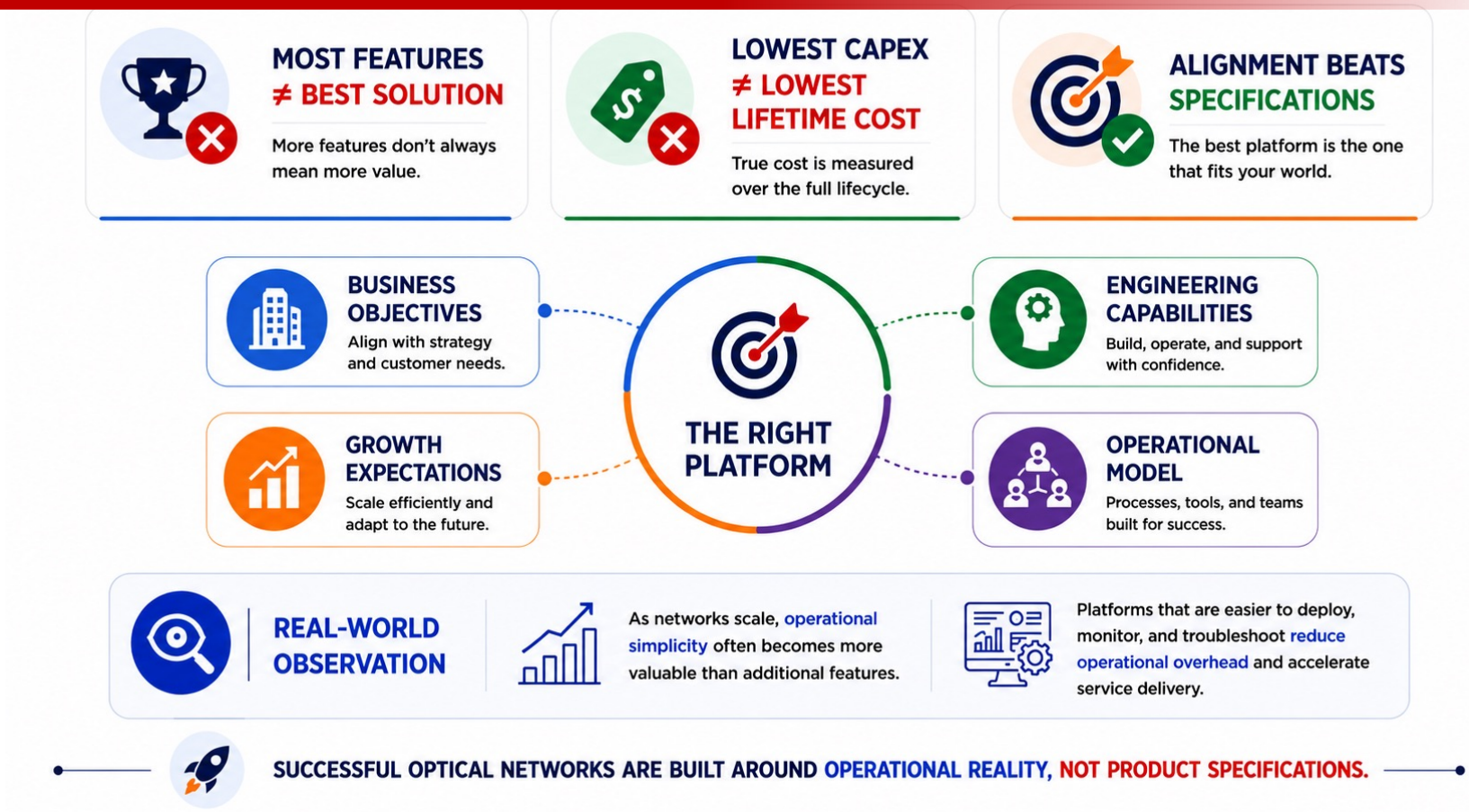
LESSON FROM REAL DEPLOYMENTS

Every decision balances **Technical**, **Operational**, and **Commercial** considerations



Successful optical deployments are rarely determined by technology alone.
They are the result of balancing technical capability, operational readiness, and commercial sustainability.

WHAT WE HAVE ADAPTED




The Road Ahead
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FUTURE OF OPTICAL TRANSPORT FOR X86

THREE KEY TAKEAWAYS

01

FIBER IS AN ASSET, BUT **OPERATIONAL EXCELLENCE** IS THE MOST VALUABLE ASSET.

02

OPEN ARCHITECTURES **PROVIDE LONG-TERM FLEXIBILITY.**

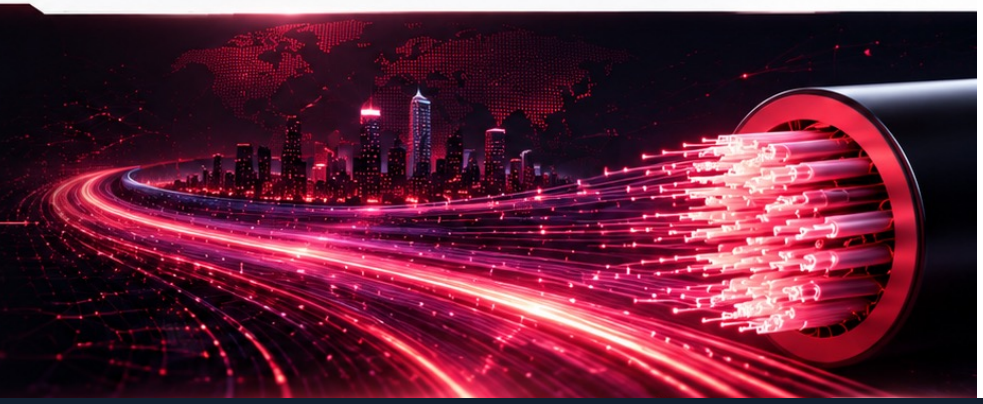
03

OPERATIONAL SIMPLICITY **SCALES BETTER THAN FEATURE COMPLEXITY.**

FINAL THOUGHT

The future is not about choosing a vendor.

It is about building a transport platform that can evolve with changing technology and increasing bandwidth demand.



CONNECT TODAY.
POWER TOMORROW.
ELEVATE MALAYSIA.

BUILDING A FASTER, SMARTER, STRONGER NATION THROUGH OPEN, INTELLIGENT CONNECTIVITY.

So, if you're building **fiber**, deploying a **DWDM network**, running a **Data Centre**, or just want to learn

Let's build Malaysia's **next-gen DCI** together

Let's **talk**.

INTERCONNECT WITH YOU.

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