HP Proactive Networking

HP ProCurve Hubs & Switches

10 Gigabit Ethernet

Concepts & Concerns

Daniel Dove

HP ProCurve Networks

3/10/99

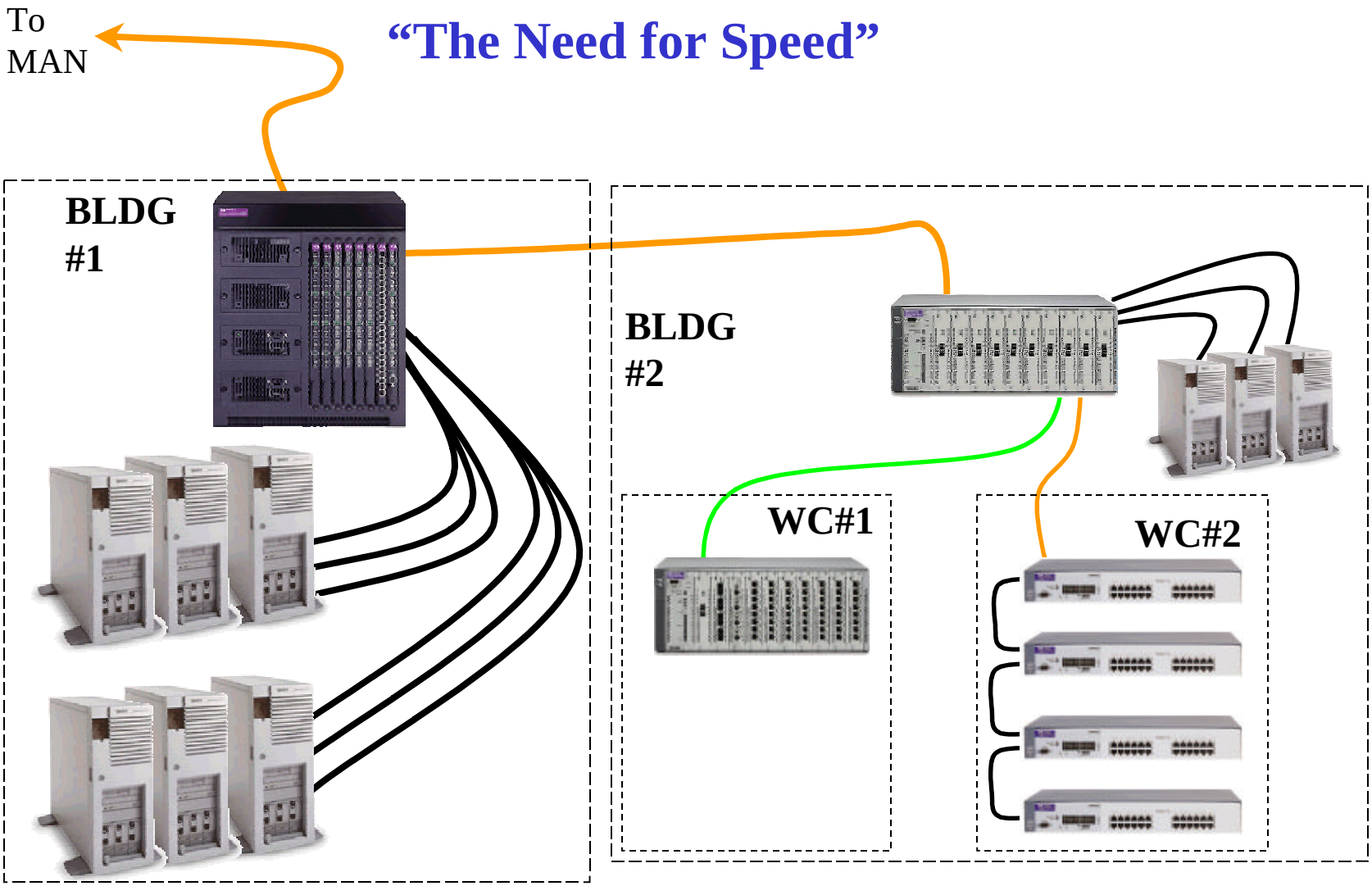
HEWLETT PACKARD

Less Work, More Network

www.hp.com/go/network_city

Network Architectures

"The Need for Speed"



MAC Alternatives

One MAC @ 10Gbps

+ Straightforward MAC Implementation
- Requires more complex qualification for transmission
- Sensitive to HOL Blocking

Four MACs @ 2.5Gbps

+ Straightforward MAC Implementation
+ Eliminates Skew concerns for multi-channel PHYs
+ Requires less complex qualification for transmission
- Requires Link Aggregation

Cost Alternatives

SiGe (One Channel @ 10Gbps)

+ Great performance
- Lower levels of integration
- Much more sensitive to PC board layout and design
- Low Industry volume => High cost

CMOS / Bipolar (Four Channels @ 2.5Gbps)

+ Demands less performance
+ Potentially useful for low-cost Cu link
+ High Industry volume => Low cost

Link Requirements

Long Haul (MAN/RAN) Link

- ✓ Extend Ethernet across cities/regions
- ✓ Lower cost solution than SONET but still high

Campus Backbones

- ✓ 2-5 Kilometer range for campus
- ✓ Demands lower cost than LH solution

Building Backbones

- ✓ 200 - 500 meter range for buildings
- ✓ Supports mmf
- ✓ Demands lower cost than CB solution

Wiring Closet/Server Cluster Interconnect

- ✓ 10-20 meter range for clusters
- ✓ Supports Cu
- ✓ Demands lower cost than FO solution

Speed Scalability

We have Auto-Negotiation and a Full Duplex link with MAC speed insensitivity; Why not...

1, 2.5, 5, 10 Gbps scalability?

+ Automatically adjust speed to meet link requirements
+ Automatically addresses link performance limitations
+ Provides fall-back without 10x loss in performance

Conclusions

+ Cost, while not an issue for MAN, will be paramount for WC and Server Clusters

+ Four MAC Channels should be considered with link aggregation

+ 10G-MII may allow;

- ✓ 10Gbps Serial LH Link
- ✓ 4x2.5Gbps WWDM LX CB Link
- ✓ 4x2.5Gbps WWDM SX BB Link
- ✓ 4x2.5Gbps Cu WC Link

+ Speed Scalability should be considered