



Evolution from 10 G to 40 G & 100 G

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Supporters

- Schelto Van Doorn – Intel
- Ilango Ganga – Intel
- Shimon Muller – Sun
- Andy Bechtolsheim – Sun
- Osamu Ishida – NTT
- Shoukei Kobayashi – NTT
- Paul Kolesar – CommScope
- Bruce Tolley – Solarflare
- David Martin – Nortel
- Piers Dawe – Avago
- Brad Turner – Juniper Networks
- George Oulundsen – OFS
- Robert Lingle, Jr. – OFS
- Ali Ghiasi – Broadcom
- Petar Pepeljugoski - IBM

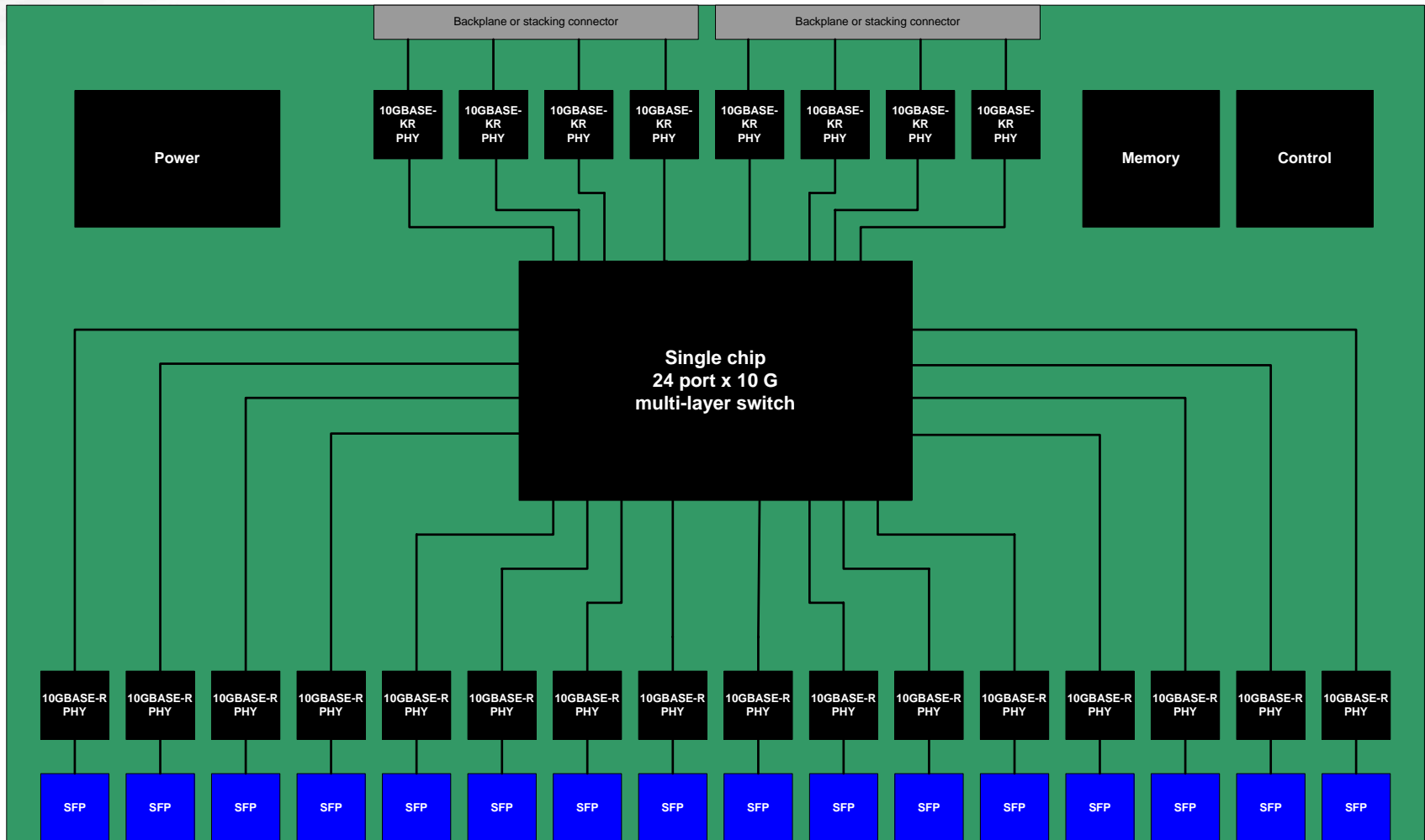
Introduction

- Multi-port, multi-layer 10 G Ethernet switches are being manufactured in volume today
- Experience with previous operating speeds indicates that higher levels of component integration will be desired in order to reduce cost

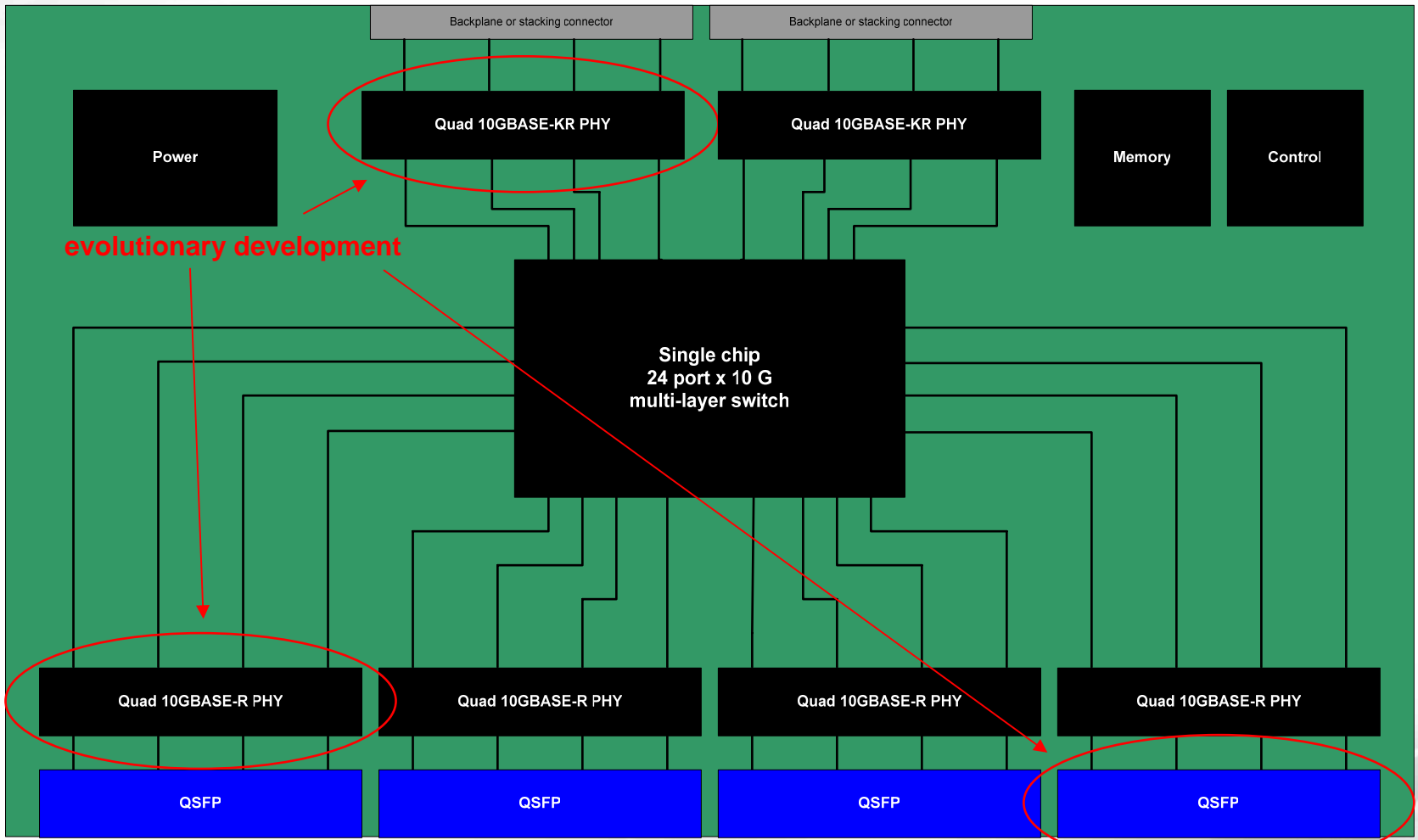
Evolution from 10 G to 40 G & 100 G

- 10 G products undergoing cost reduction
 - Single 10 G PHYs → Quad 10 G PHYs
 - Single 10 G optics → QSFP optics
- 10 G port density increasing
- 10 G port cost decreasing

Conceptual 10 G Ethernet switch



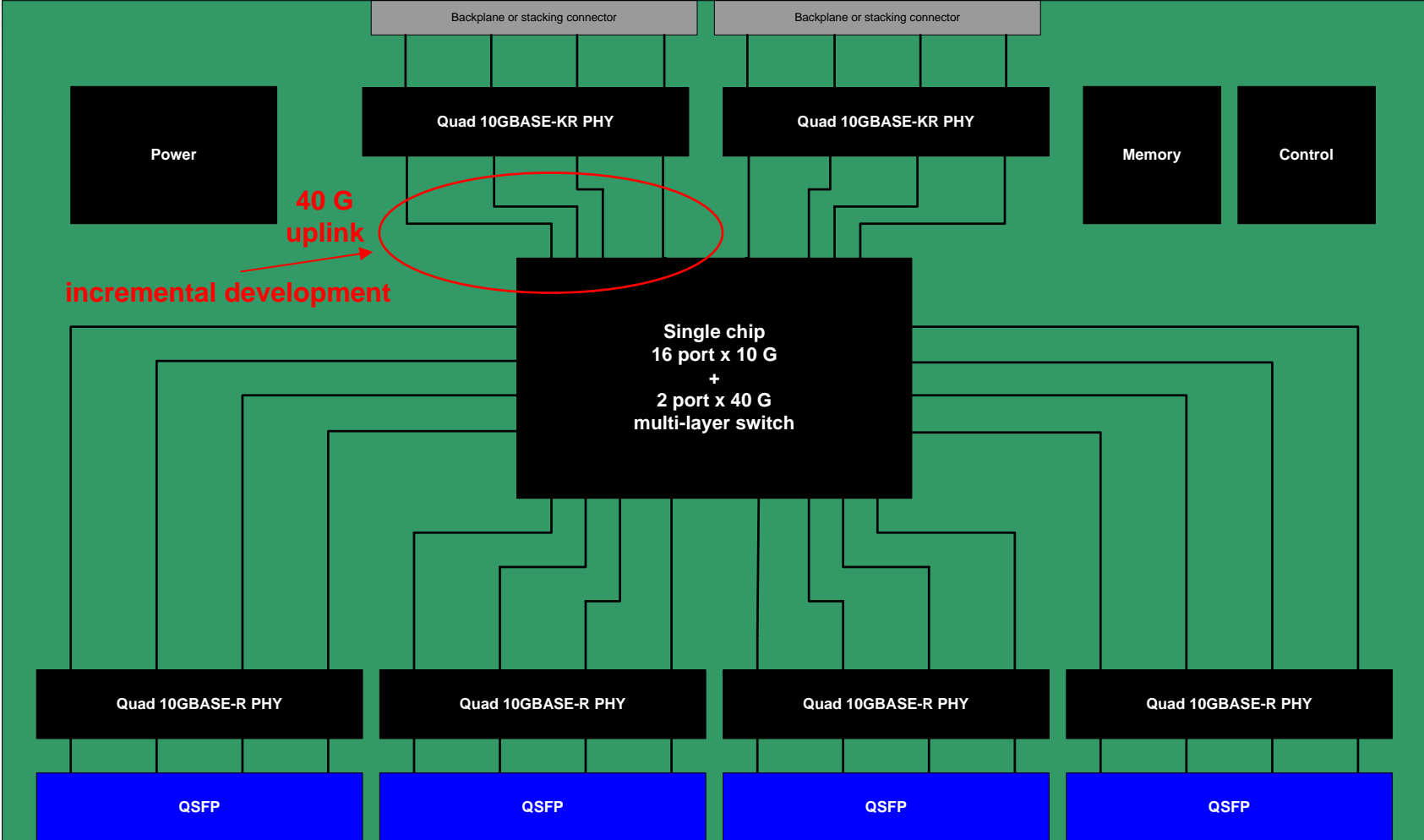
Conceptual cost-reduced 10 G Ethernet switch



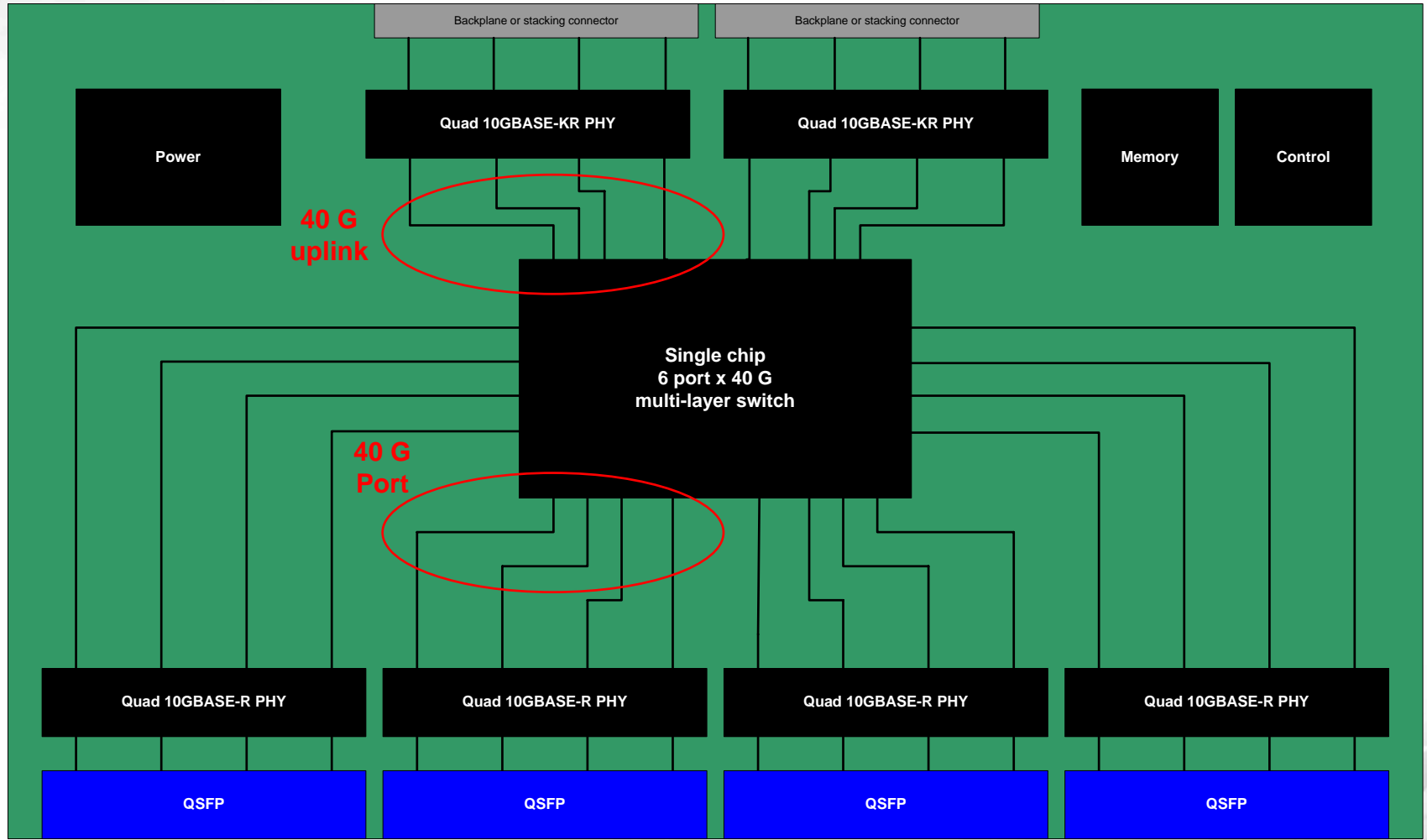
10 G to 40 G

- Very small incremental effort
 - “shim” between MAC and PHY to make 4 x 10 G behave like a 40 G fat pipe
- Re-use Quad PHYs, QSFP optics

Conceptual 10 G Ethernet switch with 2 x 40 G uplinks



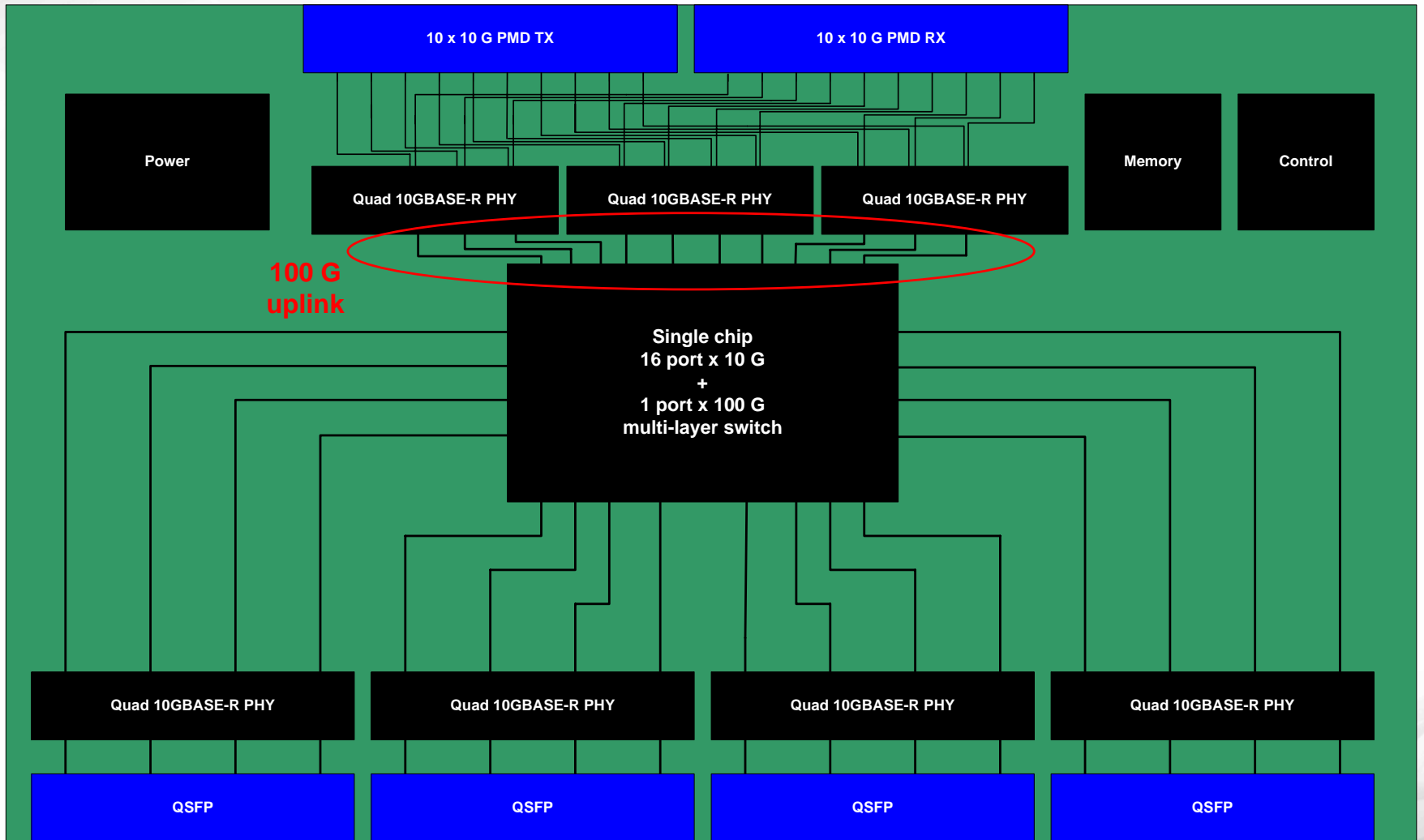
Conceptual 40 G Ethernet multi-port switch



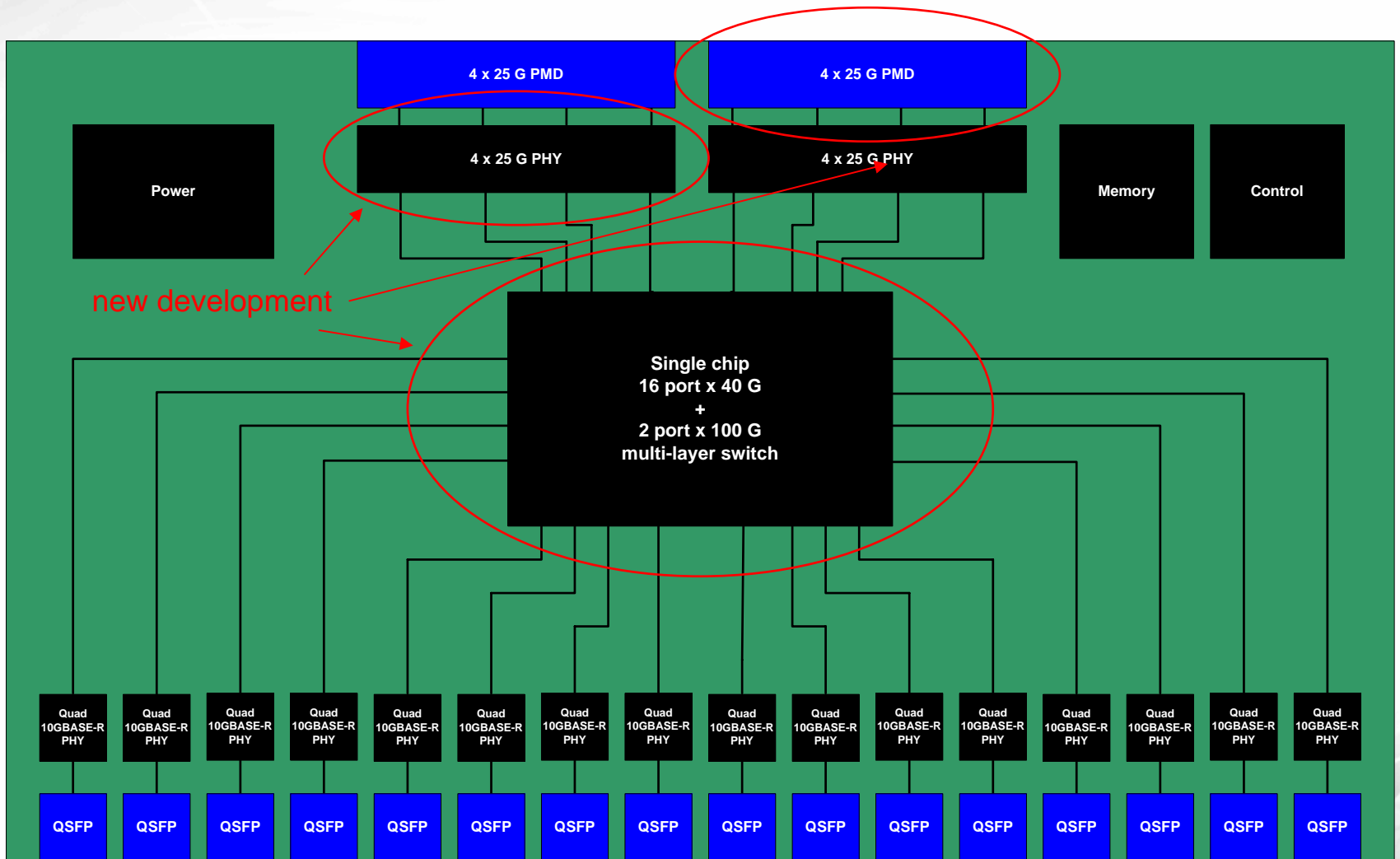
40 G to 100 G

- Requires new 4 x 25 G PHYs and optics
- 10 x 10 G will be useful for some applications

Conceptual 10 G Ethernet switch with 100 G uplink



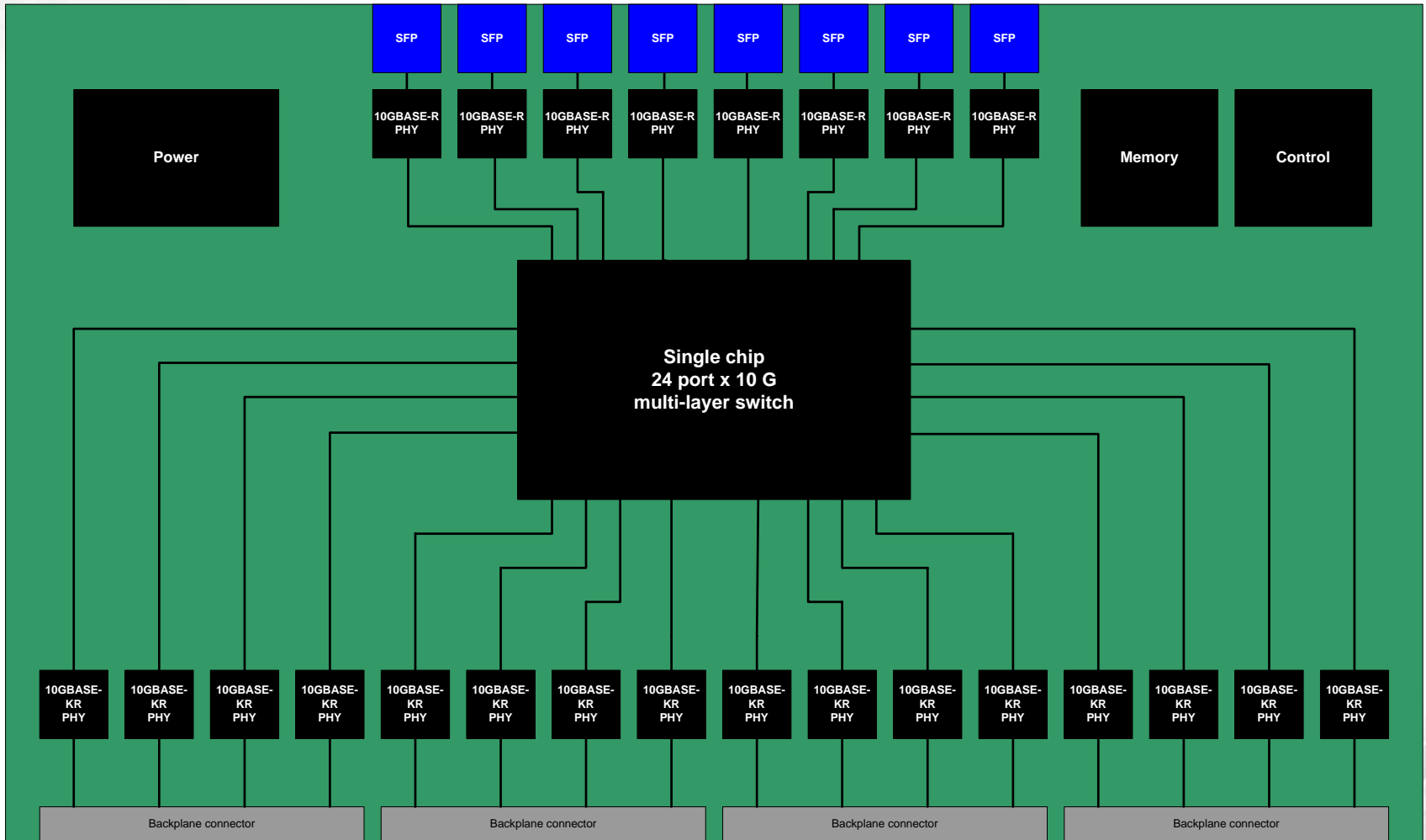
Conceptual 40 G Ethernet switch with 2 x 100 G uplinks



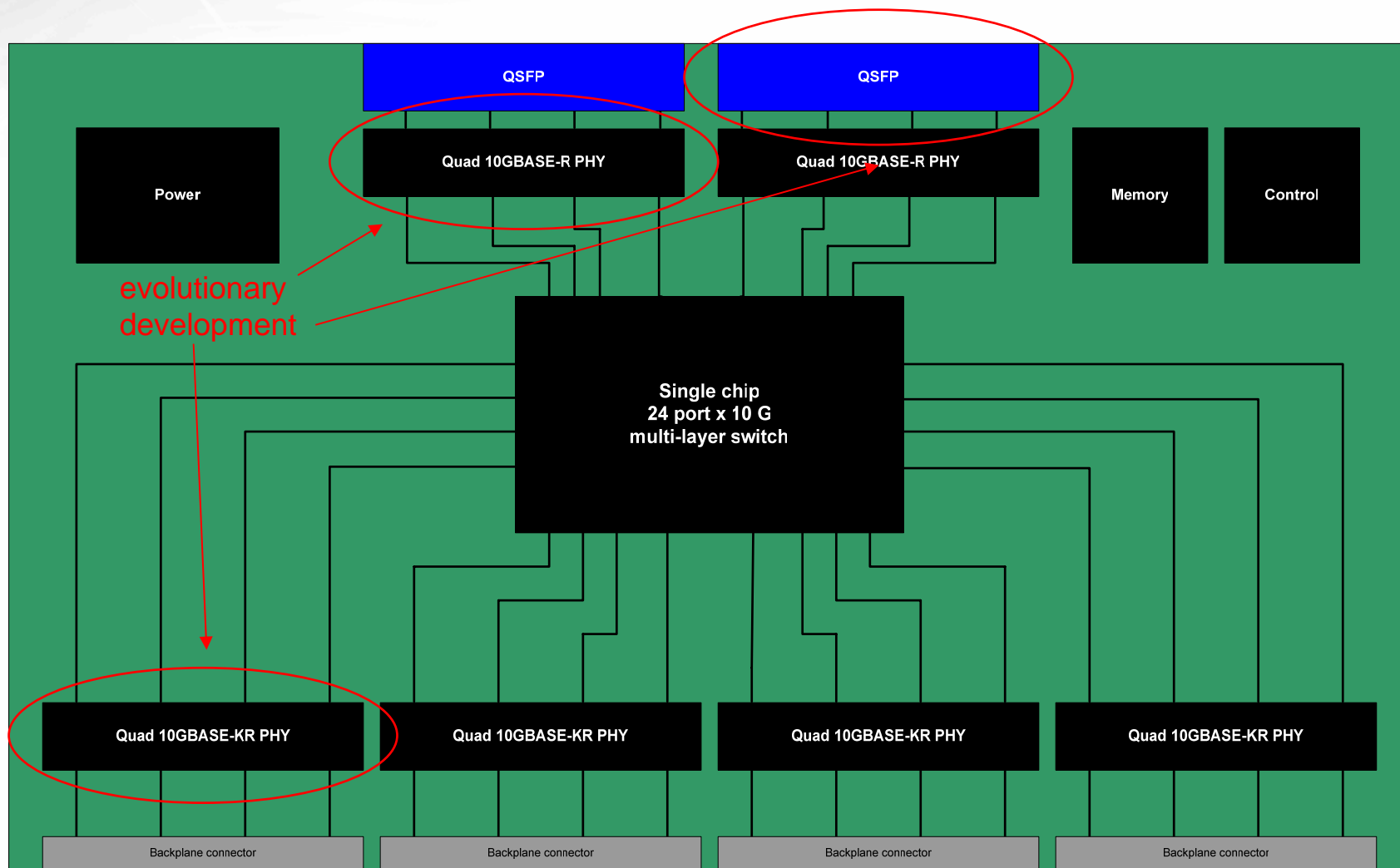
Other applications

- Similar progression can be applied to blade server switches
- Assumes that 40 G host interface controllers will also be developed
 - 40 G is a good match for PCI-e bandwidth

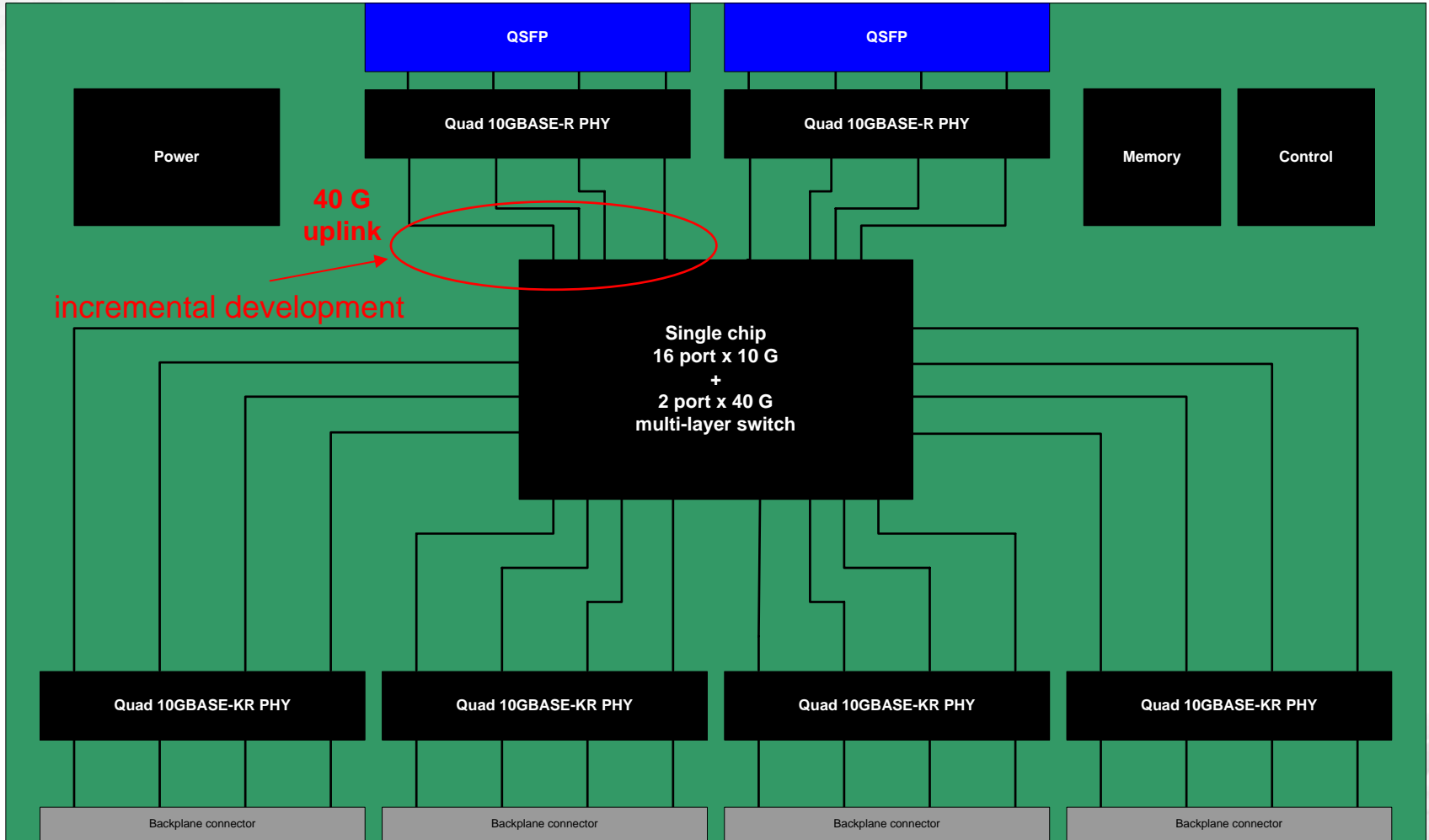
Conceptual 10 G Ethernet blade server switch



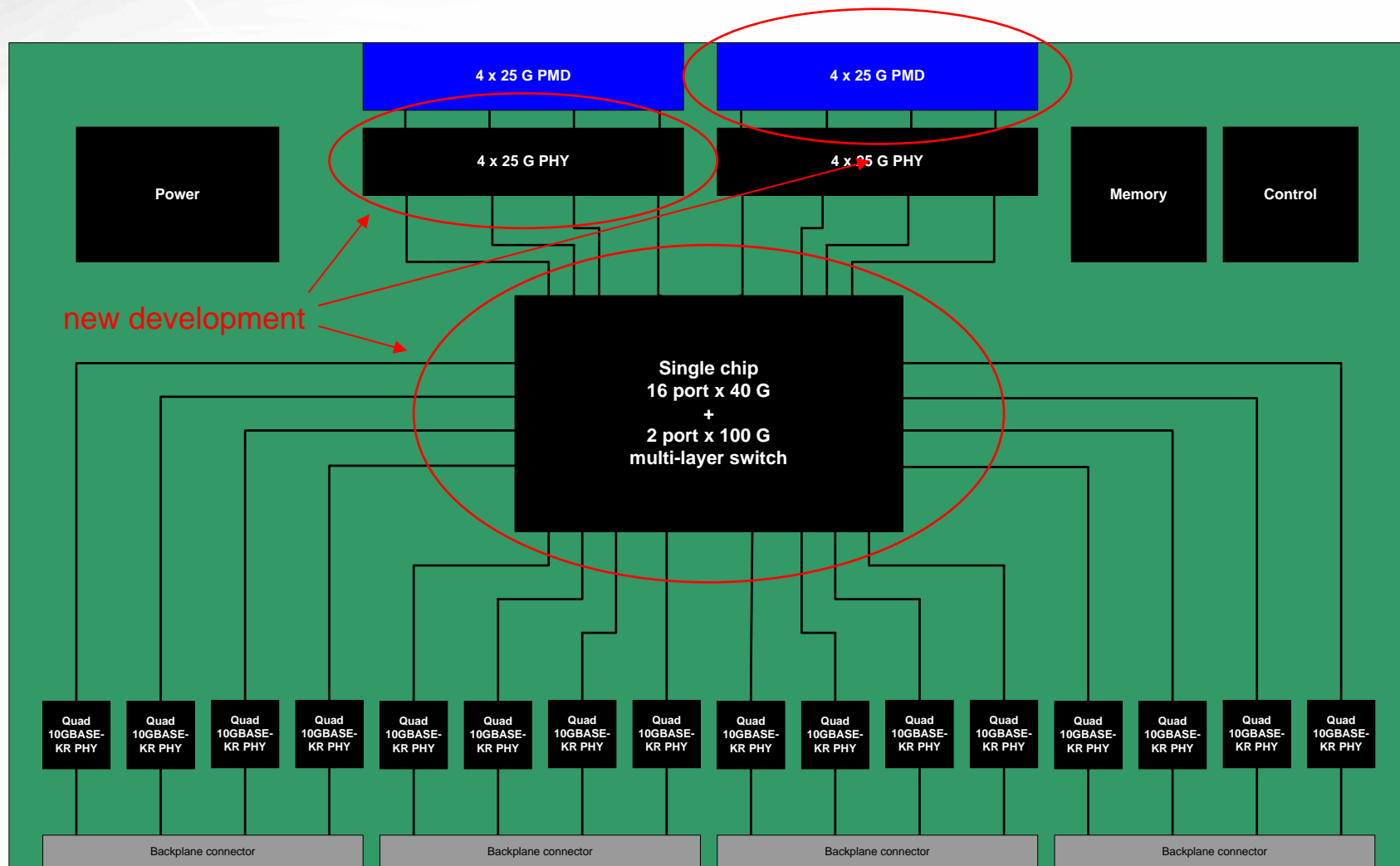
Conceptual cost reduced 10 G Ethernet blade server switch



Conceptual 10 G Ethernet blade server switch with 2 x 40 G uplinks



Conceptual 40 G Ethernet blade server switch with 2 x 100 G uplinks



Summary

- 40 G is an evolutionary step from 10 G
 - small incremental effort
 - significant incremental volume
- 40 G will be the right interface for servers 2010 – 2017
- 100 G development proceeds in parallel
 - Uses a different set of resources from 40 G development