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BACKHAUL TRENDS

Volume 1, Issue 2

WHITE PAPER

Virtual Bonding:
innovative mobile
backhaul switching
technology [PDF](#)

Welcome back to Backhaul Trends!

In a tough economic climate, mobile operators need innovative technologies to deliver advanced services while maintaining low CAPEX and OPEX. At Celtro, we leverage creativity, market insight, and expertise to deliver the solutions that mobile operators need - above and beyond standard IP/MPLS platforms.

Recently, we released our cutting-edge "Virtual Bonding" (VB) technology – which is the focus of this issue. VB is aimed at allowing more flexibility and better utilization of existing infrastructure - helping overcome shortage of capacity and budget.

We hope you find VB relevant and helpful. We'd be happy to hear your comments and questions at newsletter@celtro.com.

Sincerely,
Ron Zor, CEO

EVENTS

11-14 May 2009
[Transport Networks for
Mobile Operators 2009](#)
Amsterdam, Holland



VIRTUAL BONDING™ - MEETING MOBILE INTERNET CHALLENGES

As the mobile Internet moves into the mainstream, rapid increases in radio segment capacity have not been matched in the mobile backhaul network. To accommodate current and future mobile Internet needs, and ensure service uptake, the backhaul network must be scaled up for greater capacity delivery and better user experience – all at a lower cost.

To help operators meet these challenges, Celtro has developed unique Virtual Bonding™ (VB) technology. VB technology bonds together a variety of physically separate links, carried by diverse networks using different access technologies. The resulting virtual backhaul pipe has a capacity and peak rate delivery equal to the accumulated capacity and peak rates of all the bonded links.

Celtro's VB technology enables operators immediate high speed backhaul connectivity – without costly and lengthy infrastructure upgrade projects. Leveraging existing equipment, mobile operators can obtain cell site connectivity of up to 50Mbps, resulting in:

- ➔ Cost-effective backhaul scalability
- ➔ Increased user peak rate for better QoE
- ➔ QoS support for voice and data services
- ➔ Load sharing for higher service availability

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VIRTUAL BONDING CAPABILITIES

Because Virtual Bonding is based on higher layer bonding, it overcomes infrastructure and technology dissimilarities between the bonded links. Bonded links can carry ATM or IP/Ethernet traffic, or a combination of ATM traffic on some of

the links and IP/Ethernet traffic on others. Bonded links can use different physical layers (including copper/DSL, fiber, and microwave) and can be symmetric or asymmetric, or any combination of the two.

The primary features of VB are:

- ➔ **Maximizing user peak rate delivery** – Virtual Bonding provides peak rate delivery for each user, based on the aggregated peak rate of all virtually bonded links
- ➔ **Load sharing and protection** - traffic load is shared among all virtually bonded links to protect traffic and services in the event of link failure
- ➔ **QoS support** - enables mixing of voice and data traffic over VB with guaranteed prioritization and performance

[More Information](#)

SAMPLE APPLICATIONS: HOW IS VB USED?

➔ 50 Mbps to cell site with VB using multiple VDSL2 and E1 links

A cell site connected with copper infrastructure uses xDSL technology to deliver backhaul connectivity of 50Mbps on the downstream and 10Mbps on the upstream. For high downstream throughput, four VDSL2 links with up to 12M downstream capacity are used; for symmetric high-availability delivery of the R-99 and signaling traffic, E1 over SHDSL is used.

Celro's VB was implemented using a Celro DMT1016 switch at the cell site and a DMT4000 at the RNC site, providing 50M downstream and 10M upstream for HSPA traffic using four VDSL2 links and one IMA group of four E1s that also carries the R-99 traffic.

➔ 40Mbps to cell site with VB using 8 E1 microwave link and ADSL2+

A cell site connected with microwave infrastructure has eight E1s and can use two ADSL2+ links, each providing 12M on the downstream and 1M on the upstream - delivering backhaul connectivity of 40Mbps on the downstream and 18Mbps on the upstream. For high downstream throughput, both ADSL2+ and E1 over microwave technologies are used; for symmetric high-availability delivery of the R-99 and signaling traffic and the main upstream capacity, E1 over microwave is used.

Celro's VB was implemented using a Celro DMT1016 switch at the cell site and a DMT4000 at the RNC site, providing 40M downstream and 18M upstream for HSPA traffic using two ADSL2+ links and one IMA group of eight E1s that also carries the R-99 traffic.

[More Information](#)



Want to learn more?

Download our free Virtual Bonding white paper [here](#), or visit www.celro.com

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