CMTS and Docsis 3.0 update

Daniel Etman, Product Manager CMTS BU

This Roadmap is included for informational purposes only and is subject to change at Cisco's sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
Cisco’s Commitment to the Industry

Market Leadership
- Leading CMTS vendor
- First with EuroDocsis 3.0 ds bonding, IPv6 and Multicasting

Technology Leadership
- 4 worldwide development centers
  - San Jose, Boxborough, Bangalore, Shanghai
- 300 development engineers working on CMTS’s
- Over 2000 development engineers company wide
  - working on CMTS related development

Largest Product Portfolio in the Industry
- uBR10K
- uBR7246VXR
- uBR7225VXR
  - All have a roadmap to full EuroDocsis 3.0

Investment Protection
- Only vendor with Investment Protection track record.
  - All in house development, no acquired technology forcing forklift

Over 6,600 ubr10K’s shipped
End-to-End Cisco DOCSIS 3.0 Solution

- **<15K Subs/Hub**
  - EPC3010 Data Modem
  - 8X4 DOCSIS 3.0

- **>15K Subs/Hub**
  - EPC3212 EMTA
  - 2 Phone Lines
  - 8X4 DOCSIS 3.0
  - EPC3925 Wireless Gateway
  - 2 Phone Lines
  - 8X4 DOCSIS

**Phase 1 - 88**
- Downstream and 160 Upstream channels, IPv6

**Phase 2 - 184**
- Downstream and 160 Upstream channels, dynamic multicast

**Phase 3 - I-CMTS**
- MC2020, 304 Downstream and 160 Upstream channels

**Phase 4 - 3G60, 512**
- Downstream and 480 Upstream channels
Cisco uBR product Family
Roadmap to Docsis 3.0

“This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document”
Cisco’s uBR product Family

Roadmap to Docsis 3.0

This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
“This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document”
uBR10K

I-CMTS & M-CMTS

This Roadmap is included for informational purposes only and is subject to change at Cisco's sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
2006 – MC520 Line Card

- DS: 40
- US: 160
- DOCSIS: 1.x, 2.0

- RF Performance
- RF Density
- HA
- IPv6 MC520
2007 – 2 x ED3.0 DS SPA

- DS: 40 → 76
- US: 160
- DOCSIS: 1.x, 2.0, 3.0 BRONZE
- I-CMTS & M-CMTS
- >2x DS Capacity
- D1.x/2.0 Load Balancing
- D3.0 Bonded Services
- NO RF Re-Cabling – Lo OPEX
2008 – 6 x ED3.0 DS SPA

- Cost per Downstream Channel
- Density

- DS: 40 → 76 → 148
- US: 160
- DOCSIS: 1.x, 2.0, 3.0 BRONZE
- EuroDOCSIS EHP compatible
- I-CMTS & M-CMTS

- >4x DS Capacity
- Scale and High Availability
- D1.x/2.0 LB and D3.0 Bonding
- NO RF Re-Cabling – Lo OPEX
2009 – MC2020V Line Card

- DS : 40 → 160
- US : 160
- EuroDOCSIS : 1.x, 2.0, 3.0 FULL
- I-CMTS
- >7x DS Capacity
- Large Scale, HA & USCB
- D1.x/2.0 LB and D3.0 Bonding
- NO RF Re-Cabling – Lo OPEX
2009 – MC2020V Line Card

- Cost per Downstream
- Density

- DS: 40 → 76 → 148 → 268
- US: 160
- EuroDOCSIS: 1.x, 2.0, 3.0 FULL
- I-CMTS & M-CMTS
- >7x DS Capacity
- Very large Scale, HA & USCB
- D1.x/2.0 LB and D3.0 Bonding
- NO RF Re-Cabling – Lo OPEX
Modular versus Integrated CMTS

Integrated CMTS - Downstream QAMs part of CMTS Core

- Benefits
  - Simple, self contained

- Restrictions
  - Data only
  - Fixed configurations limited by chassis and line-card configuration
  - Onwards cost curve inflexibility

Modular CMTS – Downstream QAMs external to CMTS Core

- Benefits
  - Allows Converged Data + Video services on M-CMTS EQAM
  - Scalability beyond chassis restrictions
  - Operators can pick ‘best of breed’ M-MCTS EQAM
  - M-CMTS EQAM competition as a cost driver

- Restrictions
  - Requires DTI server
  - Considerations needed for HA EQAM redundancy
Cisco uBR10K MC2020 Linecard

- Full DOCSIS 3.0 support
  - Downstream Bonding
  - Upstream Bonding
  - IPv6
  - Multicast
  - AES (in Hardware)

- Upgrade for MC520 LCs
  - Same RF Cabling
  - Retains 520 config
  - Very low operational impact

- Full HA support
  - Can act as fail-over card for 520 and 2020 line-cards

- Utilizing RFGW-1D phy
  - No change in RF behaviour

- Utilizing us phy of the 520H
  - No change in RF behaviour

- Beta cards currently in customer labs
- Orderability open NOW!!
- FCS scheduled for December 8
MC2020 Features

1. Full DOCSIS 3.0 compliance
   - DS bonding/US bonding
   - Legacy DOCSIS 1.x and 2.0 modem support
   - Multicast, IPv6 and other DOCSIS 3.0 specs
   - S-CDMA and logical channels
   - AES encryption
   - Qualification planned 2nd Half CY2010

2. Line rate performance on US and DS on all channels (Annex A/B)

3. MC2020 as Protect for MC520 and MC2020

4. Full Feature parity with MC520H

5. Support with both PRE-2 and PRE-4

6. Interoperable with the EuroDOCSIS 3.0 M-CMTS DS SPA

7. SW licensing available
2010 – MC3G60 Line Card

- DTCC
- MC 3G
- 2 x 10GE UPLINK SPA

- Costs per Downstream Density
- DS: 40 → 76 → 148 → 268 → 432
- US: 160 → 480
- EURODOCSIS: 1.x, 2.0, 3.0 FULL
- M-CMTS
- >12x DS Capacity
- 3x US Capacity
- Massive Scale
Cisco uBR10K MC3G60 Linecard

- Full DOCSIS 3.0 & M-CMTS Support
- >12x DS capacity in same uBR10K installed chassis
  - 40 88 184 304 576 DS
  - ~20Gbps DOCSIS connectivity
  - 5 to 6 times the DS capacity of competitive CMTS platforms
- 3x US capacity (160 480 US)
- Full HA
- Software licensing to enable selectable DS & US counts
  - 1G24, 2G48, 3G24, 3G60, etc…
  - Special V-DOC configurations to minimize cost-per-Video DS
- Scalability for triple play services

- FCS planned for Q4 2010
# uBR10K Supported Hardware Configurations

<table>
<thead>
<tr>
<th>SPA Carrier Type</th>
<th>WAN SPA Type</th>
<th>PRE-2</th>
<th>PRE-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 SPA SIP</td>
<td>HHGE</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4 SPA SIP-600</td>
<td>HHGE</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4 SPA SIP-600</td>
<td>5x1GE</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>4 SPA SIP-600</td>
<td>1x10GE</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Supported configurations (with maximum configuration per option):

**PRE-2**
1. PRE-2 + 1x SIP-600 + 4xHHGE with 2x D3.0 SPA on SIP-600
2. PRE-2 + 1x SIP-600 + 4xHHGE with 4x D3.0 SPA on SIP-600
3. PRE-2 + 2x SIP-600 with one 5x1GE + 2x D3.0 SPA per SIP-600
   (*with 2 GE ports activated only*)

**PRE-4**
1. PRE-4 + 2xSIP-600 with one 5x1GE + 3x D3.0 SPA per SIP-600
2. PRE-4 + 2xSIP-600 with one 1x10GE + 3x D3.0 SPA per SIP-600
<table>
<thead>
<tr>
<th>Chassis Solution</th>
<th>Slots</th>
<th>Total Downstream</th>
<th>Total Upstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>uBR10012 w/ 5/20 Modules</td>
<td>8 – 5x20 Modules</td>
<td>40</td>
<td>160</td>
</tr>
<tr>
<td>uBR10012 w/ Modular DS</td>
<td>8 – 5x20 Modules</td>
<td>88/76</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>2 – 24 Port DS Card</td>
<td></td>
<td></td>
</tr>
<tr>
<td>uBR10012 w/ Modular DS Q4cy08</td>
<td>8 – 5x20 Modules</td>
<td>184/148</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>6 – 24 Port DS Card</td>
<td></td>
<td></td>
</tr>
<tr>
<td>uBR10012 I-CMTS w/ 20/20 Modules</td>
<td>8 – 20/20 Modules</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>uBR10012 w/ 3G60 Modules</td>
<td>8 – 3G60 Modules</td>
<td>576/432</td>
<td>480</td>
</tr>
</tbody>
</table>
“This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document”
This Roadmap is included for informational purposes only and is subject to change at Cisco's sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
2003 – MC28U Line Card

- DS : 8
- US : 32
- DOCSIS : 1.x, 2.0
- RF Performance
- RF Density
- Time to Market
- Feature Rich
2010 – MC88V Line Card

- DS : 32
- US : 32
- DOCSIS : 1.x, 2.0, 3.0

- 4 x Downstream Capacity
- D1.x/2.0 LB and D3.0 Bonding
- NO RF Re-Cabling – Lo OPEX
- Including US Bonding
2010 – MC88V Line Card

- **DS**: 16
- **US**: 16
- **DOCSIS**: 1.x, 2.0, 3.0
- 4 x Downstream Capacity
- D1.x/2.0 LB and D3.0 Bonding
- NO RF Re-Cabling – Lo OPEX
- Including US Bonding
Cisco uBR7200VXR MC8x8 Linecard

- Full DOCSIS 3.0 support
  - Downstream Bonding
  - Upstream Bonding
  - IPv6
  - Multicast
  - AES (in Hardware)

- Upgrade for MC2x8U LCs
  - Same RF Cabling
  - Retains 28U config
  - Very low operational impact

- Utilizing RFGW-1D phy
  - No change in RF behaviour

- Utilizing us phy of the 520H
  - No change in RF behaviour

- Beta cards currently in customer labs
- FCS scheduled for Feb/March
“This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document”
Bighorn Release
12.2(33)SCC
# Features Targeting Bighorn Release (ECed)

<table>
<thead>
<tr>
<th>Feature</th>
<th>uBR10K</th>
<th>uBR-VXR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW support for MC20x20</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>US Bonding on MC5x20H (including US Dynamic BW Sharing)</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>QoS: US Class-Based Fairness</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>QoS: Configurable DOCSIS priority weights for US and DS</td>
<td>Y</td>
<td>Partial – US Only</td>
</tr>
<tr>
<td>Logical channels</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>Admission Control Enhancements (Service Flow - VDOC, D3.0)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>AToM support for L2VPN (Phase I)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>IPv6: Dual Stack CPE &amp; APM (Application Performance Management)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Full D3.0 Feature Set</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>DEPI Control Plane</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>Primary GiGE Support for WB SPA</td>
<td>Y</td>
<td>N/A</td>
</tr>
</tbody>
</table>
## Featurettes Targeting Bighorn Release (ECed)

<table>
<thead>
<tr>
<th>Feature</th>
<th>uBR10K</th>
<th>uBR-VXR</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB: Utilization-based Dynamic LB with Dynamic BW Sharing (DBS)</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Multiple Mod profiles</strong>*</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>SPA DS Channel Utilization Reporting</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Embedded Event Manager (V2.3)</strong></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>PCMM I04 ECNs for HSD and voice</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>ToS MQC Support for MC DS</td>
<td>Y</td>
<td>NA</td>
</tr>
<tr>
<td>CLI show full run to show all settings - defaults and non-defaults</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>CISL - IOS Software Licensing</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>S-CDMA (20x20 only)</strong></td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>Support for user configurable GigE output-rate</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>D3.0: CMTS CRL and OCSP Project</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>D3.0 Downstream Peak Traffic Rate TLV support for ERBA</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>HOT ICE CLI</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

* Only available on MC520H
# Featurettes Targeting Bighorn Release (ECed)

<table>
<thead>
<tr>
<th>Feature</th>
<th>uBR10K *</th>
<th>uBR-VXR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full D3.0 Multicasting support</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>Full D3.0 OSS IPDR support</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>Full D3.0 OSS SNMP/SP support</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>M-CMTS debugability: Enhance show cr10k-rp and show pxf cmd for a given MD</td>
<td>Y</td>
<td>N/A</td>
</tr>
<tr>
<td>MAC-Provisioned Device Downstream Classification</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

* Only available on MC520H
Cable Roadmap Overview

This Roadmap is included for informational purposes only and is subject to change at Cisco's sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
“This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document”
Cable Train Feature Release Timeline

- **Bighorn 12.2(33)SCC**
- **Congo 12.2(33)SCD**
- **Amazon 12.2(33)SCB**
- **Danube 12.2(33)SCE**
- **Elkhorn 12.2(33)SCF**
- **Monet 12.2(33)SCA**
- **Rembrandt 12.3(23)BC**

Timeline:
- Q4 CY07
- Q1 CY08
- Q4 CY08
- Q4 CY09
- Q1 CY10
- 2H CY10
- 1HCY11

- Available
- Scheduled
- Commit in process
This Roadmap is included for informational purposes only and is subject to change at Cisco’s sole discretion. The features will be offered on a when-and-if-available basis, and Cisco will have no liability for delay in delivery or failure to deliver any of the features set forth in this document.
uBR series EuroDocsis 3.0 Migration Summary

1. Efficient
   All uBR10K components purchased are re-used for EuroDocsis 3.0.
   uBR7246VXR deployments can be upgrade to EuroDocsis3.0 via a simple line-card change

2. Incremental
   Allows customers to incrementally add downstream capacity without affecting other services or currently deployed assets

3. Cost Effective
   Minimal equipment investment to add DS channel bonding or additional DOCSIS 2.0 DS capacity
   No up front loading of capacity, pay as you grow
   Investment Protection, no chassis forklifts
Registrujte se za Cisco Networkers
28-31. mart 2010. Bahrein