



# CMTS and Docsis 3.0 update



**Daniel Etman, Product Manager CMTS BU**

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# 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

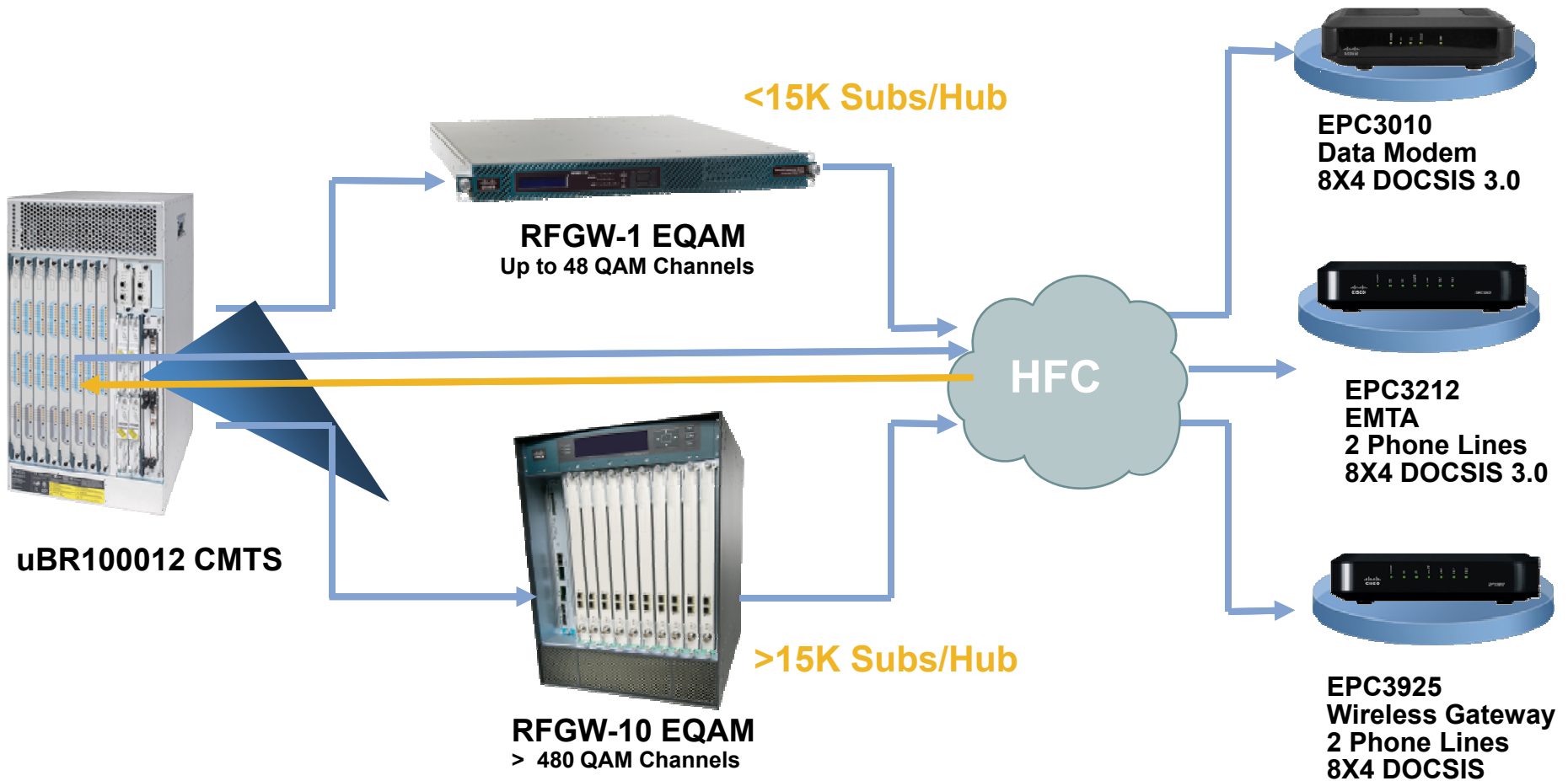
**Only vendor with Investment Protection track record.**

All in house development, no acquired technology forcing forklift



Over 6,600 uBR10K's shipped

# End-to-End Cisco DOCSIS 3.0 Solution



<p><b>Phase 1 - 88</b> Downstream and 160 Upstream channels, IPv6</p>	<p><b>Phase 2 - 184</b> Downstream and 160 Upstream channels, dynamic multicast</p>	<p><b>Phase 3 - I-CMTS</b> MC2020, 304 Downstream and 160 Upstream channels</p>	<p><b>Phase 4 - 3G60, 512</b> Downstream and 480 Upstream channels</p>
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## Cisco uBR product Family Roadmap to Docsis 3.0



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# Cisco's uBR product Family Roadmap to Docsis 3.0



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## Cisco uBR10K I-CMTS & M-CMTS



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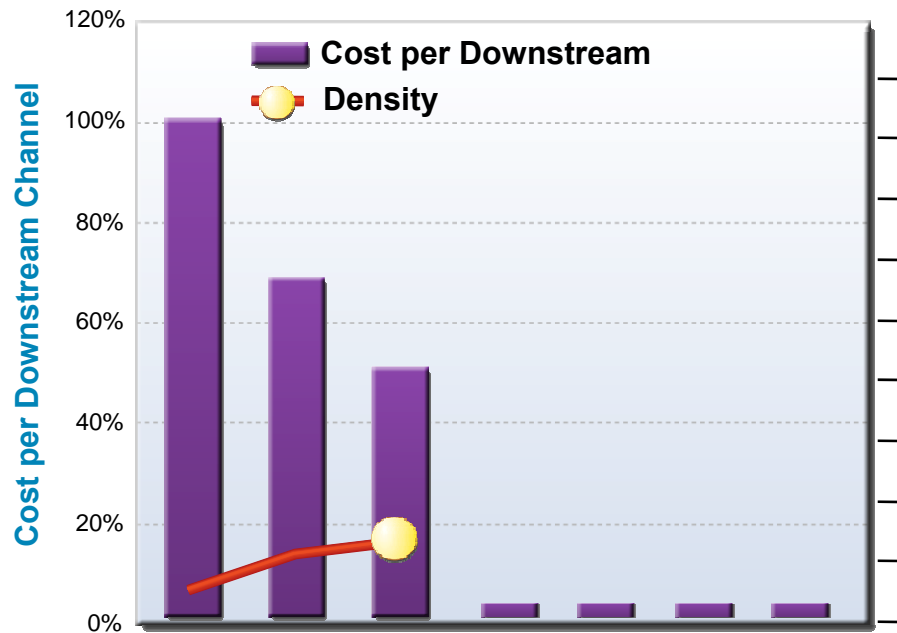
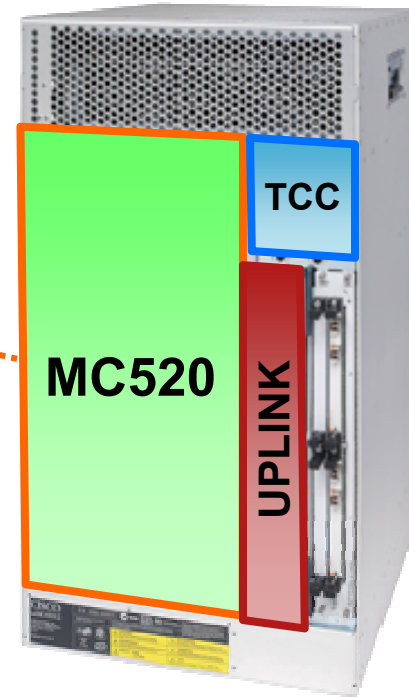
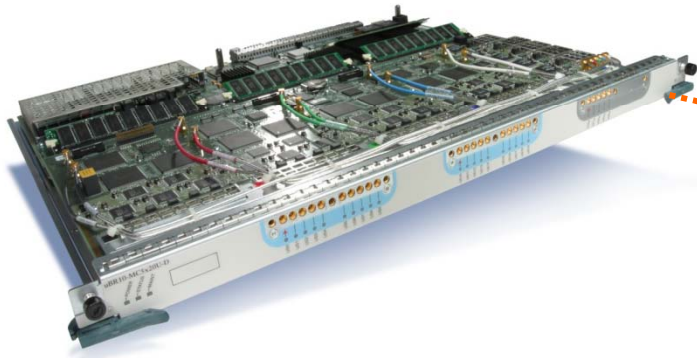
uBR10K

I-CMTS & M-CMTS



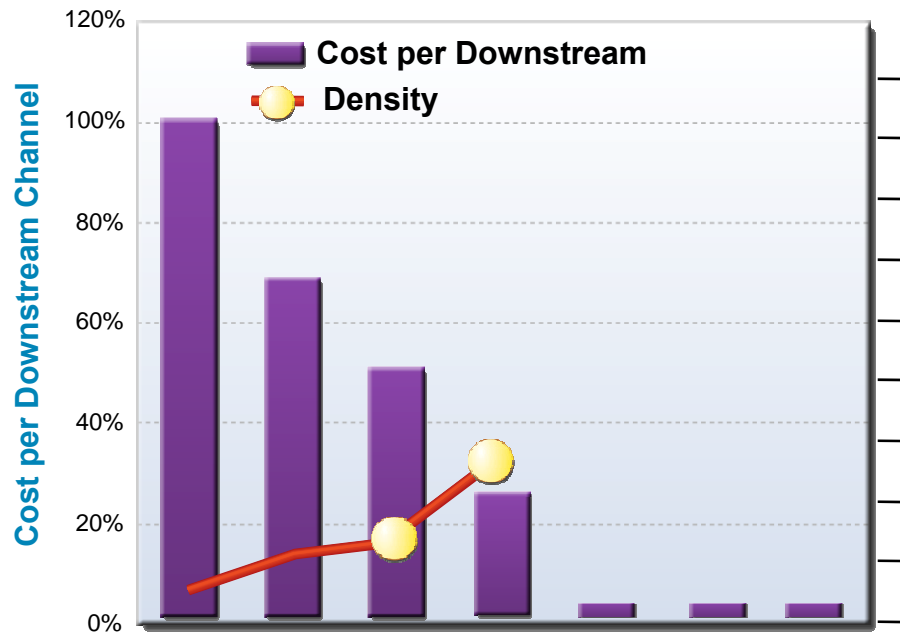
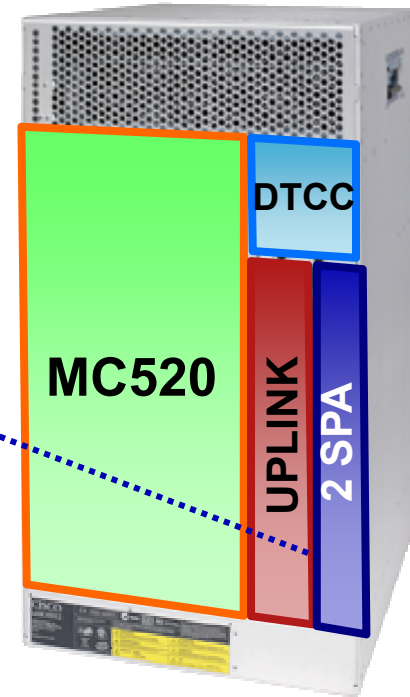
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# 2006 – MC520 Line Card



- DS : 40
- US : 160
- DOCSIS : 1.x, 2.0
- RF Performance
- RF Density
- HA
- IPv6 MC520

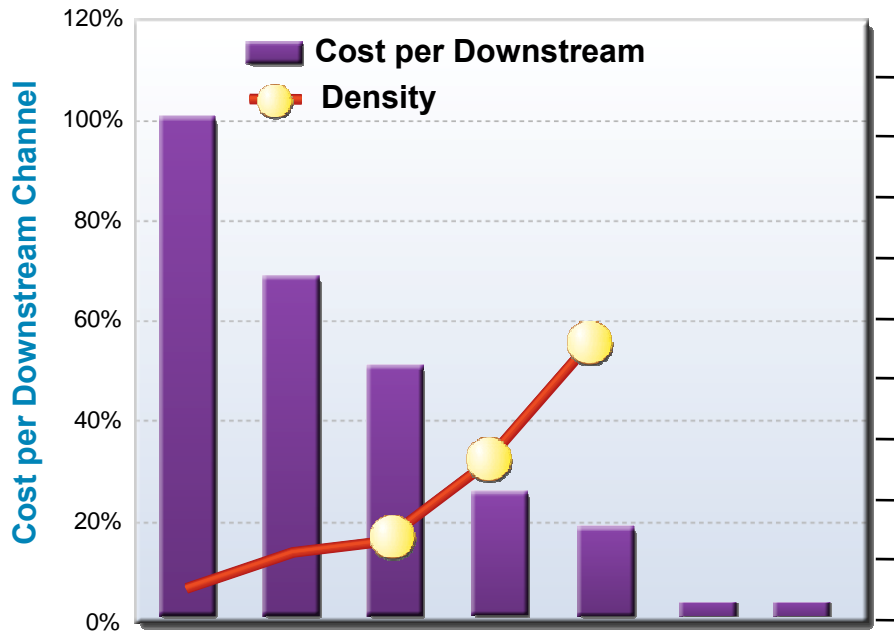
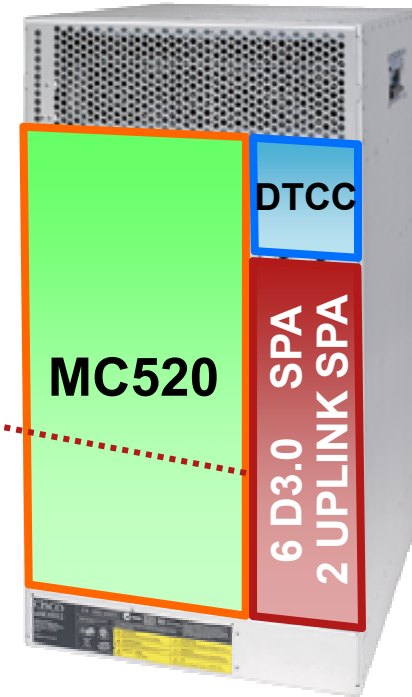
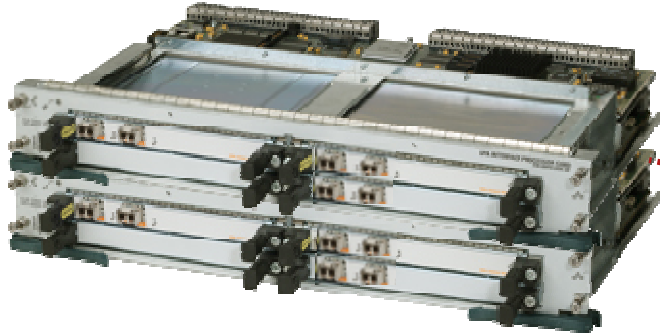
# 2007 – 2 x ED3.0 DS SPA



Density (Mbps per RU)

- 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**

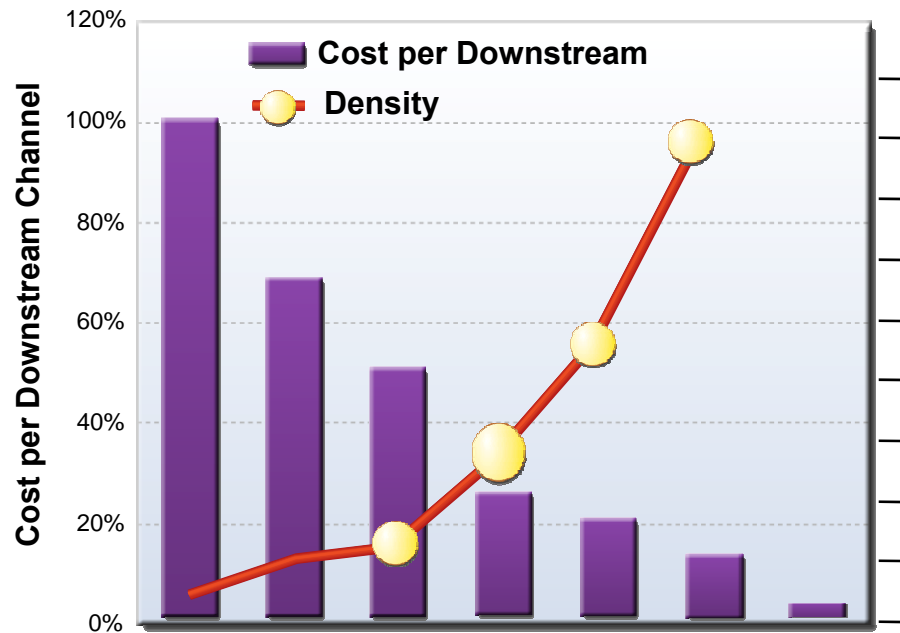
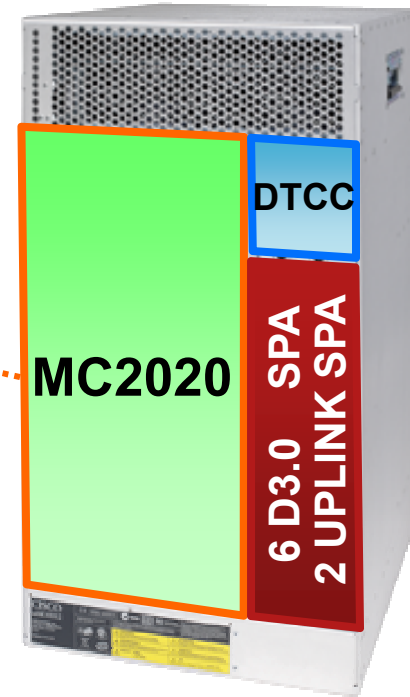
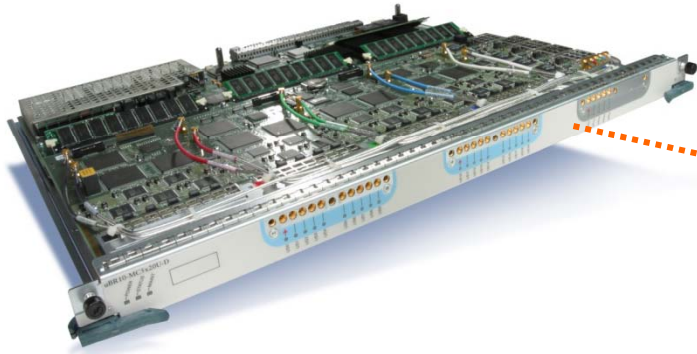
# 2008 – 6 x ED3.0 DS SPA



Density (Mbps per RU)

- 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

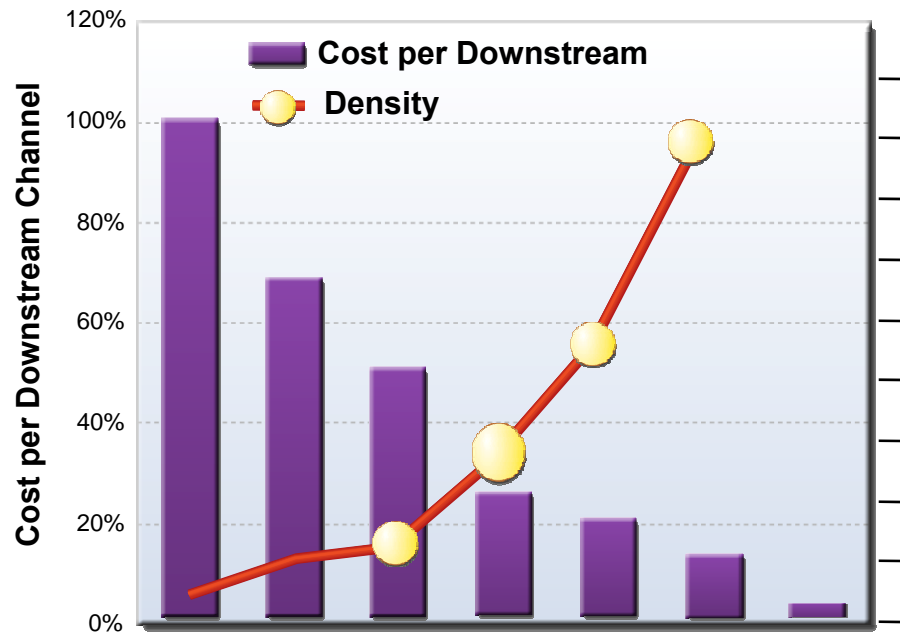
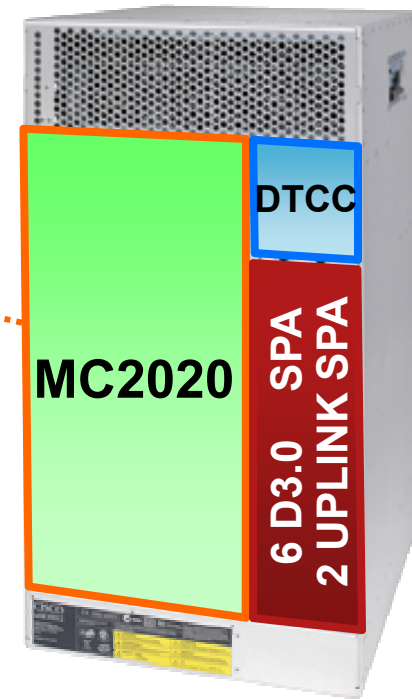
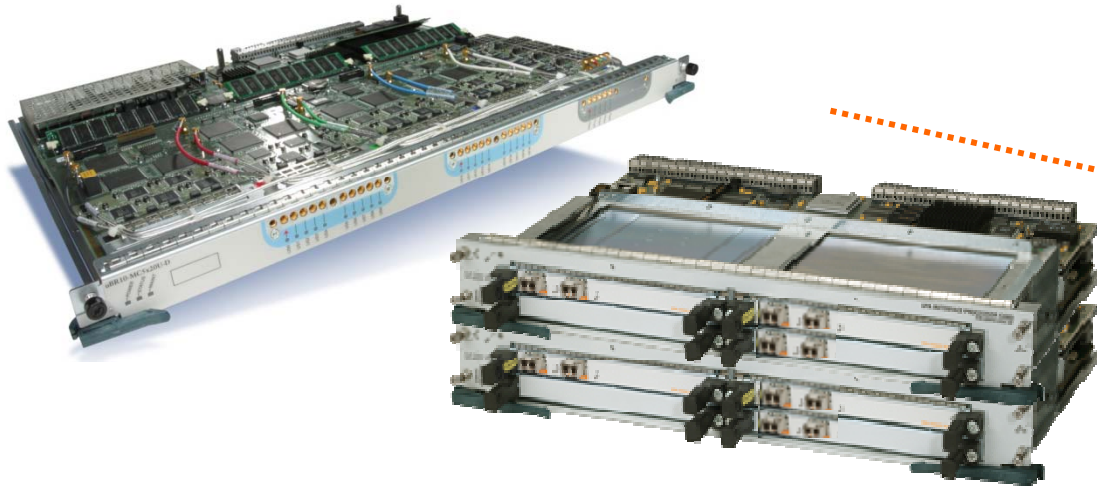
# 2009 – MC2020V Line Card



Density (Mbps per RU)

- 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



Density (Mbps per RU)

- 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

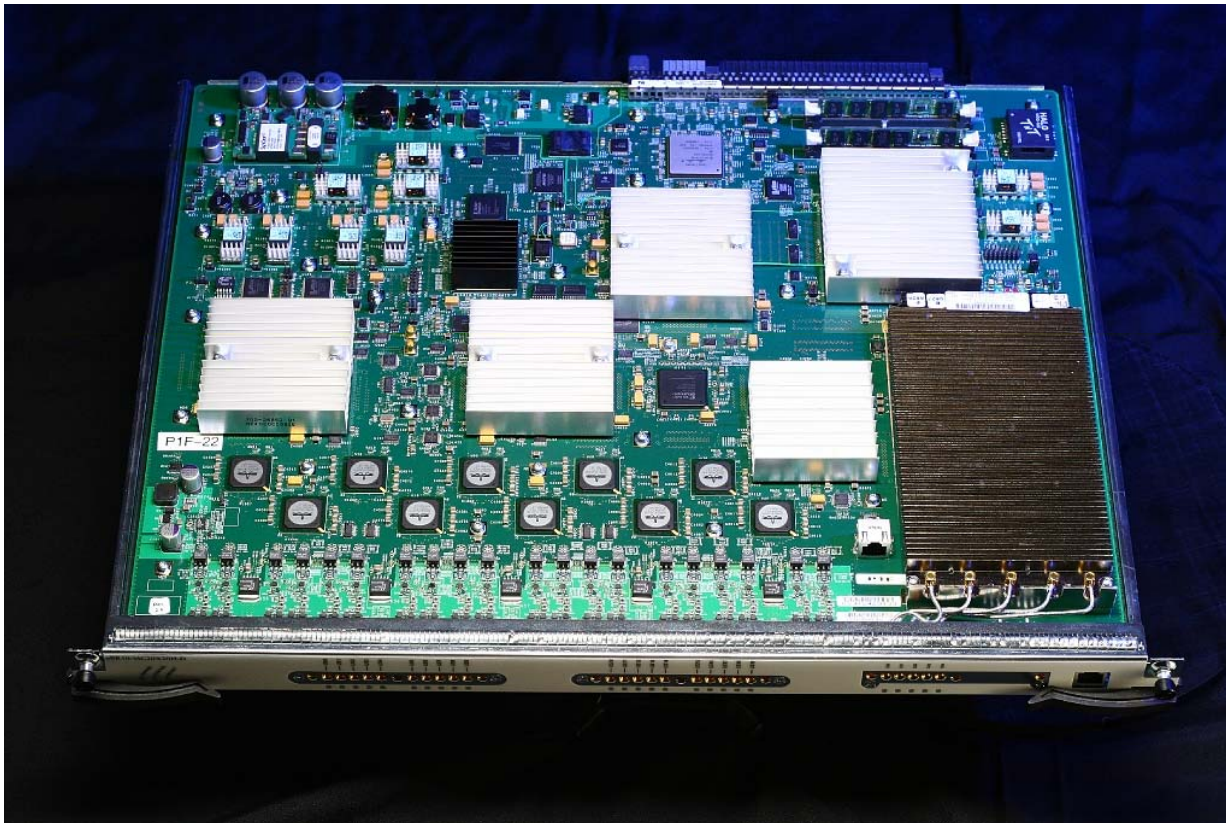
- Allows Converged Data + Video services on M-CMTS EQAM
- Scalability beyond chassis restrictions
- Operators can pick 'best of breed' M-MCTS EQAM
- M-CMTS EQAM competition as a cost driver

### -Restrictions

- Requires DTI server

Presentati-**Considerations needed for HA EQAM redundancy**

# Cisco uBR10K MC2020 Linecard



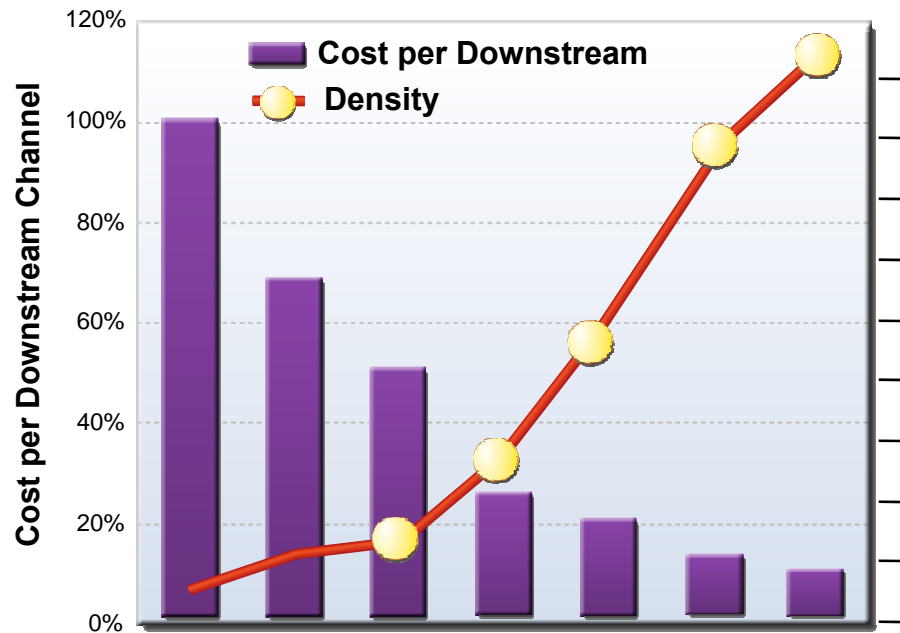
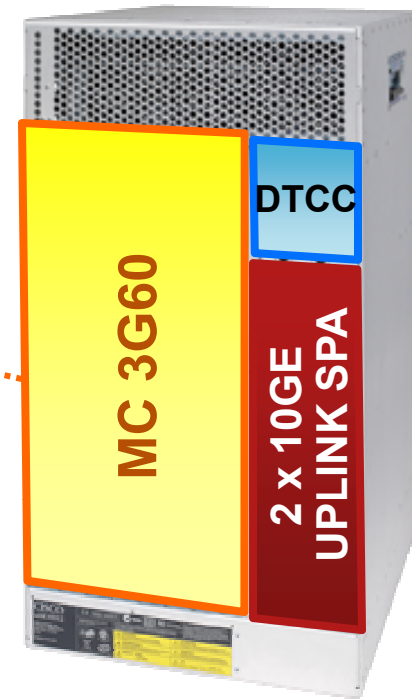
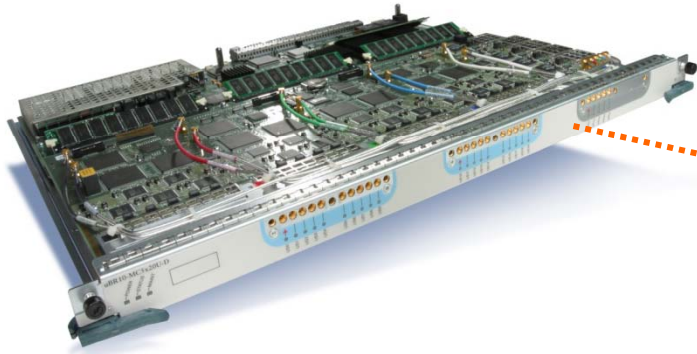
- Beta cards currently in customer labs
- Orderability open NOW!!
- FCS scheduled for December 8

- **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

# 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 2<sup>nd</sup> 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



Density (Mbps per RU)

- 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

SPA Carrier Type	WAN SPA Type	PRE-2	PRE-4
2 SPA SIP	HHGE	Yes	No
4 SPA SIP-600	HHGE	Yes	No
4 SPA SIP-600	5x1GE	Yes*	Yes
4 SPA SIP-600	1x10GE	No	Yes

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

# Cisco uBR10012 Investment Protection

## I-CMTS / M-CMTS Flexibility

Chassis Solution	Slots	Total	Total Downstream	Total Upstream
uBR10012 w/ 5/20 Modules	8 – 5x20 Modules		40	160
uBR10012 w/ Modular DS	8 – 5x20 Modules 2 – 24 Port DS Card		88/76	160
uBR10012 w/ Modular DS Q4cy08	8 – 5x20 Modules 6 – 24 Port DS Card		184/148	160
uBR10012 I-CMTS w/ 20/20 Modules	8 – 20/20 Modules		160	160
uBR10012 w/ 3G60 Modules	8 – 3G60 Modules		576/432	480

## Cisco uBR7200VXR I-CMTS



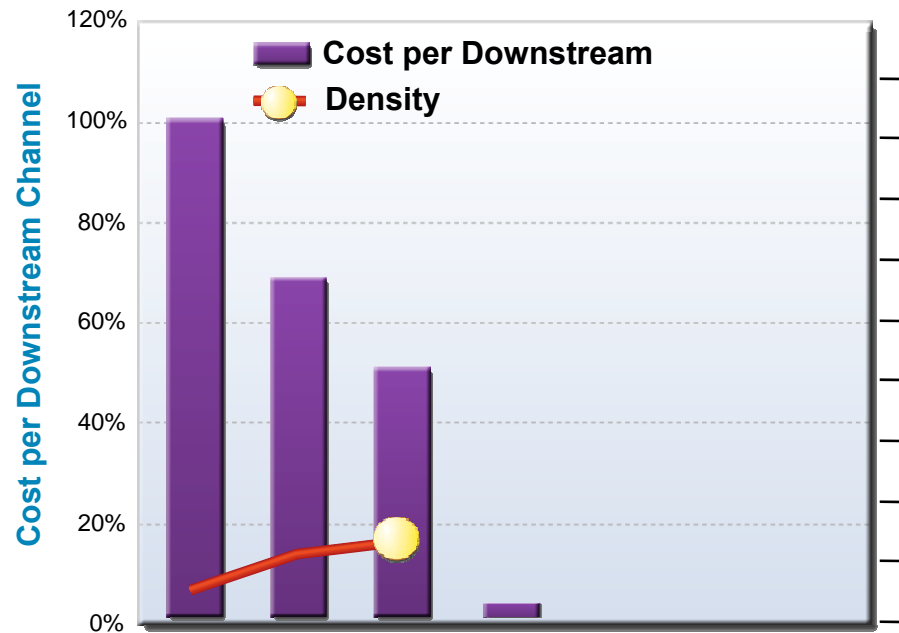
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# uBR7200VXR I-CMTS



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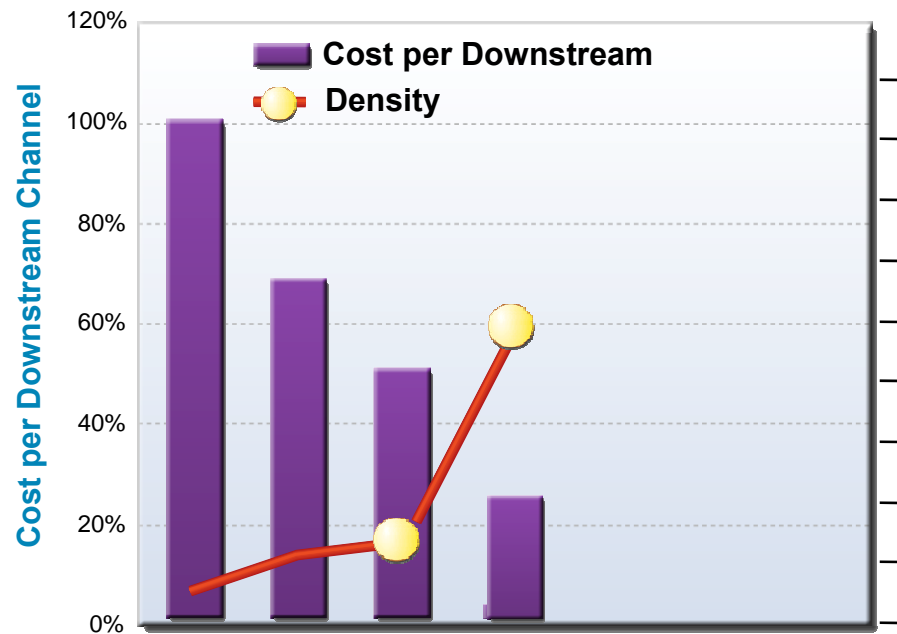
# 2003 – MC28U Line Card



Density (Mbps per RU)

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

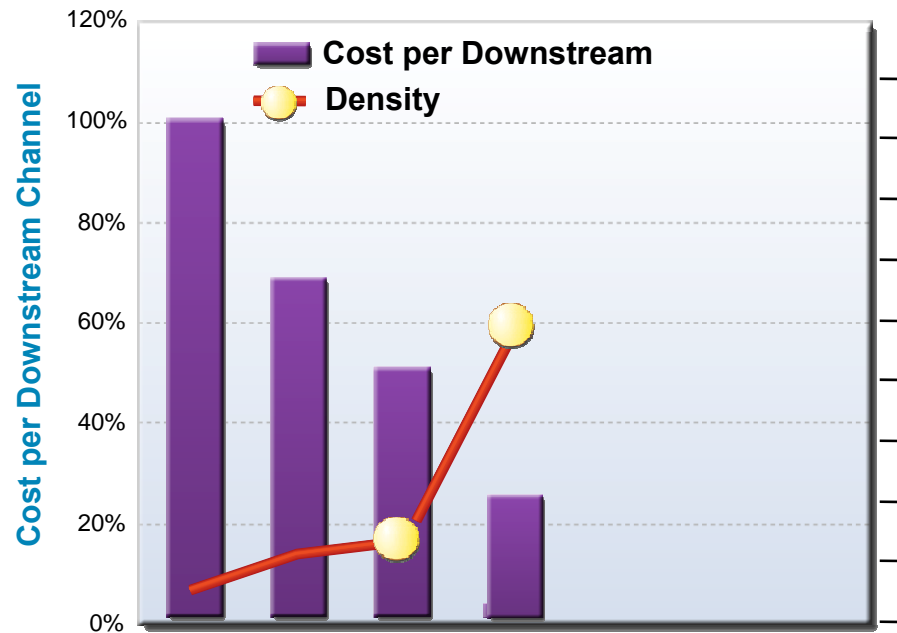
# 2010 – MC88V Line Card



Density (Mbps per RU)

- 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



Density (Mbps per RU)

- 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



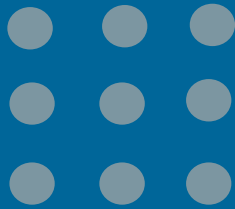
- **Full DOCSIS 3.0 support**
  - Downstream Bonding
  - Upstream Bonding
  - IPv6
  - Multicast
  - AES (in Hardware)
- **Upgrade for MC2x8U LCs**
  - Same RF Cabling
  - Retains 28U config
  - Very low operational impact
- **Utilizing RFGW-1D phy**
  - No change in RF behaviour
- **Utilizing us phy of the 520H**
  - No change in RF behaviour

- Beta cards currently in customer labs
- FCS scheduled for Feb/March

## Cisco IOS Feature overview 12.2(33)SCC - Bighorn



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## **Bighorn Release 12.2(33)SCC**

# Features Targeting Bighorn Release

## (ECed)

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

# Featurettes Targeting Bighorn Release (ECed)

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

\* Only available on MC520H

# Featurettes Targeting Bighorn Release (ECed)

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

\* Only available on MC520H

## Cable Roadmap Overview



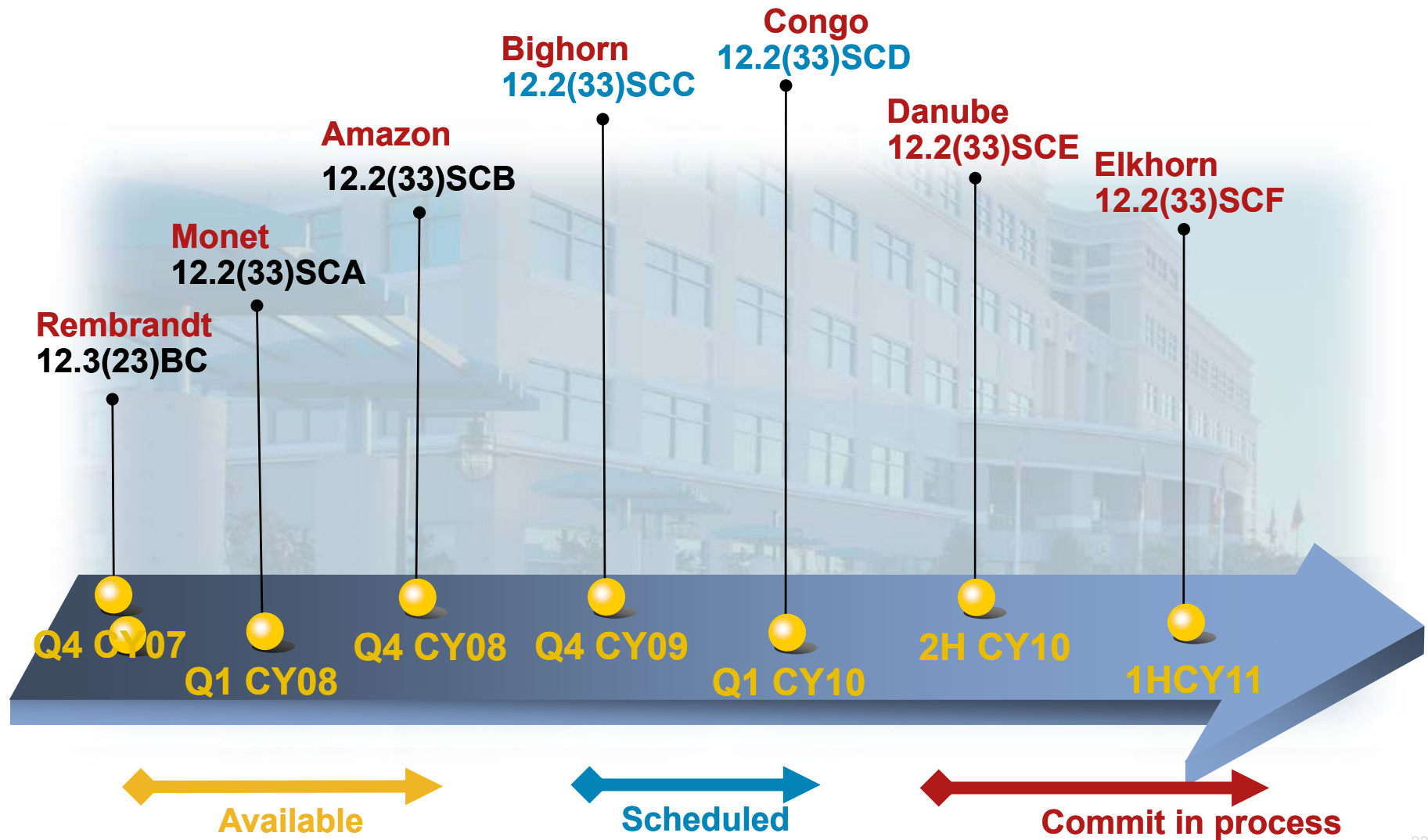
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## Roadmap Overview Hardware and Software



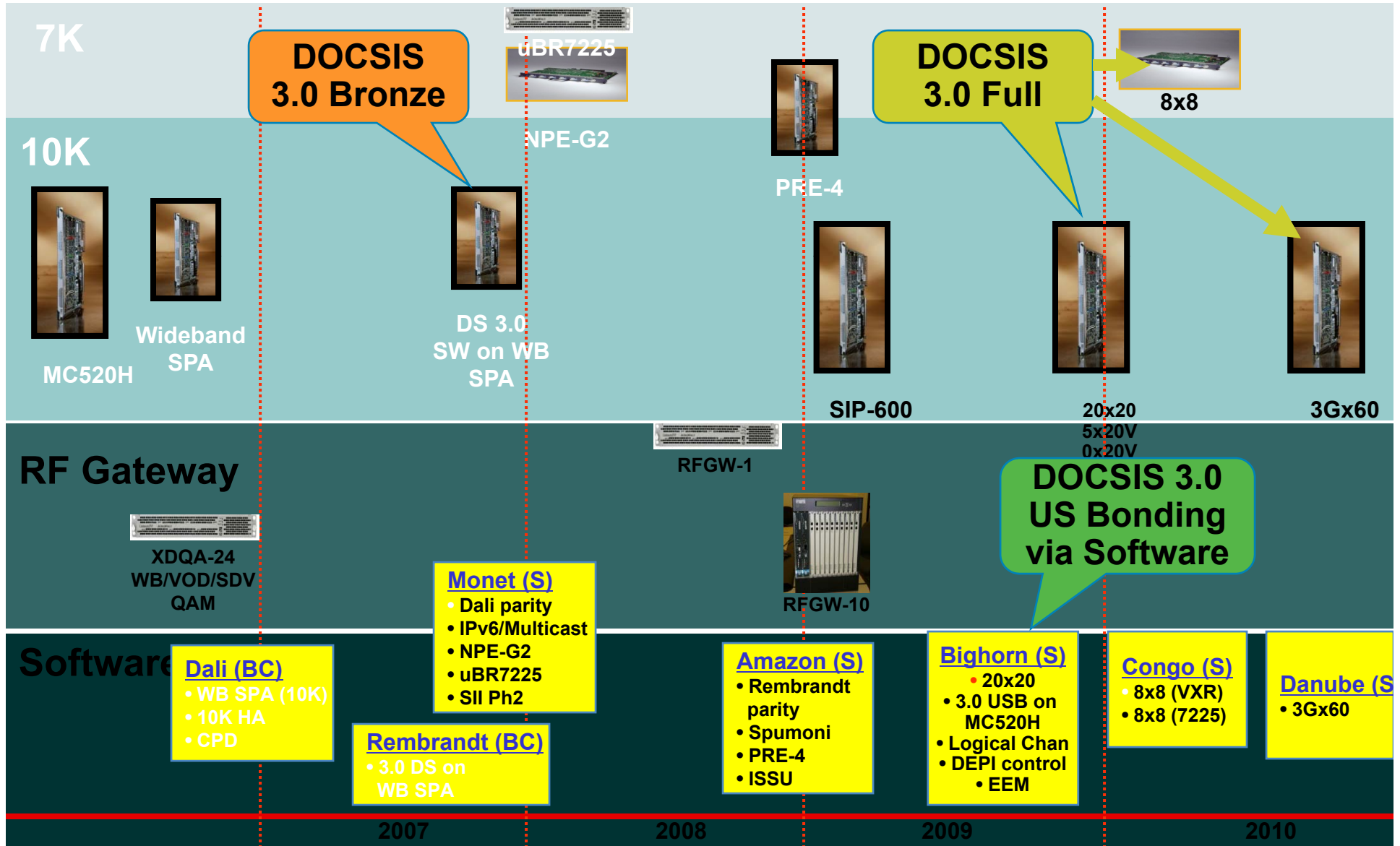
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# Cable Train Feature Release Timeline



# CMTS & QAM Roadmap – August 2009

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# 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 25-28. januar 2010. Barcelona 28-31. mart 2010. Bahrein

