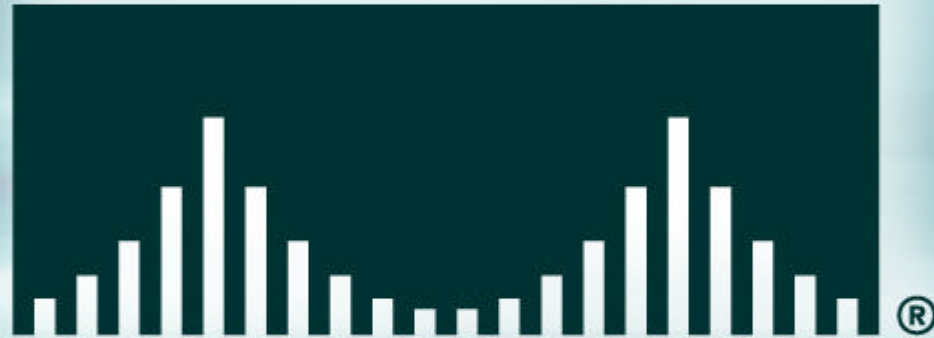


CISCO SYSTEMS



Cable Products Overview

Agenda

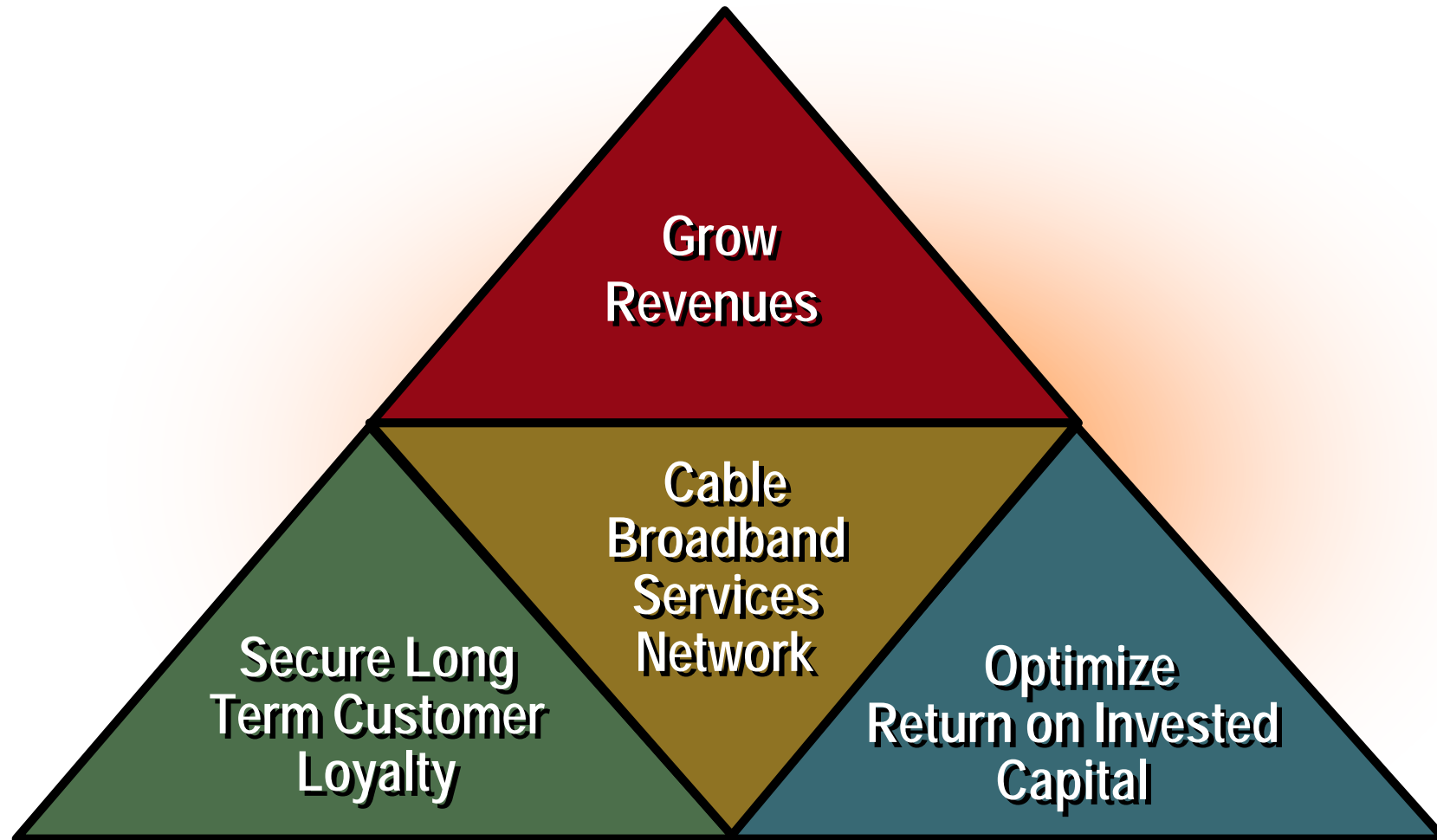
Cisco.com

- **Products Overview & Positioning**
CMTS
CPE
- **Key Features and Roadmap**
- **Summary**

Note: Cisco Cable products for Video and Provisioning/Management will be covered in later sessions.

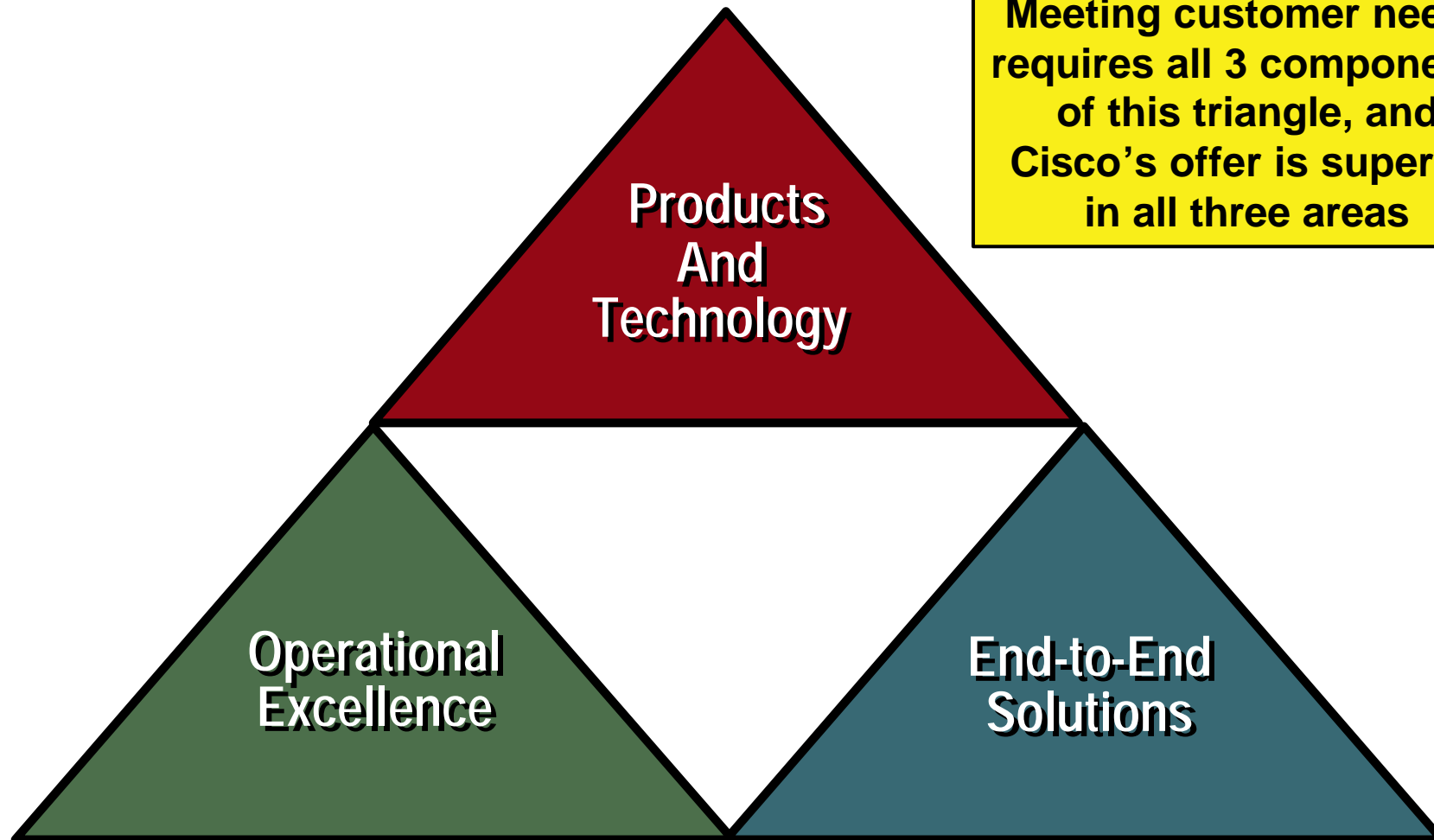
Cable Provider Imperatives

Cisco.com



Why Cisco?

Cisco.com



**Meeting customer needs
requires all 3 components
of this triangle, and
Cisco's offer is superior
in all three areas**

Cisco Universal Broadband Router— Premier Platform for Cable IP Networks

Cisco.com

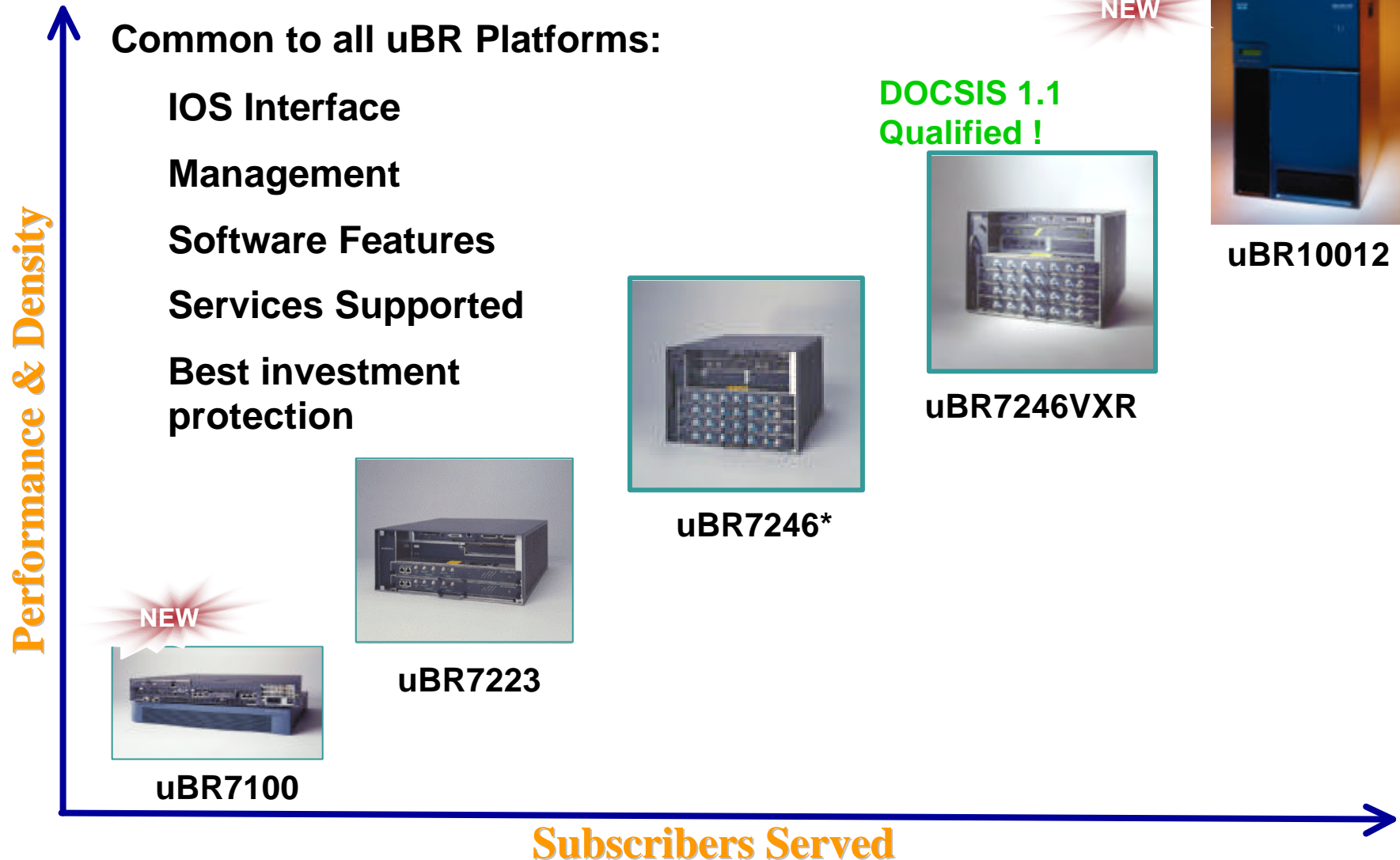
- **Highest scalability**
 - Open system, passive midplane
 - Fully upgradable processors, line cards, and software; most WAN interfaces
- **Highest performance**
 - Highest port density, today and future
 - Highest effective throughput
- **Highest reliability**
 - Carrier-class VoIP implementation
 - Proven, stable hardware and software
 - Over 250,000 upstream ports deployed
- **Best investment protection**
 - All line cards forward-compatible
 - All components upgradable

Broadest CMTS product line
Market and technology leadership
1st DOCSIS 1.1-qualified Layer 3 CMTS



Broadest CMTS Product Line + Unparalleled Investment Protection & Support

**DOCSIS 1.1
Qualified !**



Cisco uBR7100, Cisco uBR7223

Cisco.com

uBR7223 – Modular



uBR7114 – Fixed



uBR7111 – Fixed



Target Market

RF Ports (DSxUS)

**Smaller distribution hub deployment for
high growth areas
(up to 2500 subs)**

1x6, 2x8

**Smaller distribution hub deployment with
lowest initial investment
(up to 1000 subscribers)**

1x4

**MxU deployment
(up to 250 subscribers)**

1x1

Cisco uBR7246VXR

Cisco.com

- **Cisco uBR7246VXR—the industry's first qualified DOCSIS 1.1 Layer 3 CMTS**
- **Industry-proven cable and router subsystems —Built on the uBR7246 and 7200VXR respectively**
- **Increased backplane bandwidth—Provides 2x throughput increase over Cisco uBR7246 (nonVXR)**

Cisco uBR7246—1.6-Gbps* backplane

Cisco uBR7246VXR—3.2-Gbps* backplane

- **Support for new high-performance processors and line cards**

NPE-225/300/400/G1, MC28U, MC16U, synchronous clock card

**VXR accommodates high growth rates
while enabling the high-touch services**

* Some de-rating apply due to A) Multiplexing address and data on a PCI bus, B) % mix of read (slow) vs. write (fast) operations, and C) Burst transfer sizes

Cisco uBR10012

Cisco.com



- **Optimized for aggregation**
 - Maximizes intelligence at edge of network
 - Offers consistent high performance with features enabled
 - Modular architecture that's designed to scale to very high density compared to commonly deployed uBR7246VXR configuration
 - Balanced system, maximizes useful capacity where needed
- **Investment protection**
 - Allows reuse of existing line cards
 - Seamless extension of Cisco uBR7200 – same s/w, CLI, mgmt. interface
- **In-box redundancy**

Cisco uBR900 Series — Business-Class CPE Products for Commercial Services

Cisco.com

- **Highest Performance**
 - Only modems with integrated routing
 - Multi-protocol VoIP support
 - Hardware accelerated IPSEC
 - Enhanced security
- **Best Return on Investment**
 - Enables high-margin services
 - Combines functionality of 2 to 3 boxes*
 - Supports multiple PCs and IP phones
- **Superior Scalability**
 - Proven, reliable IOS software
 - Simple provisioning and operation

• Only Commercial Cable Modems
• Market & Technology Leadership

uBR905

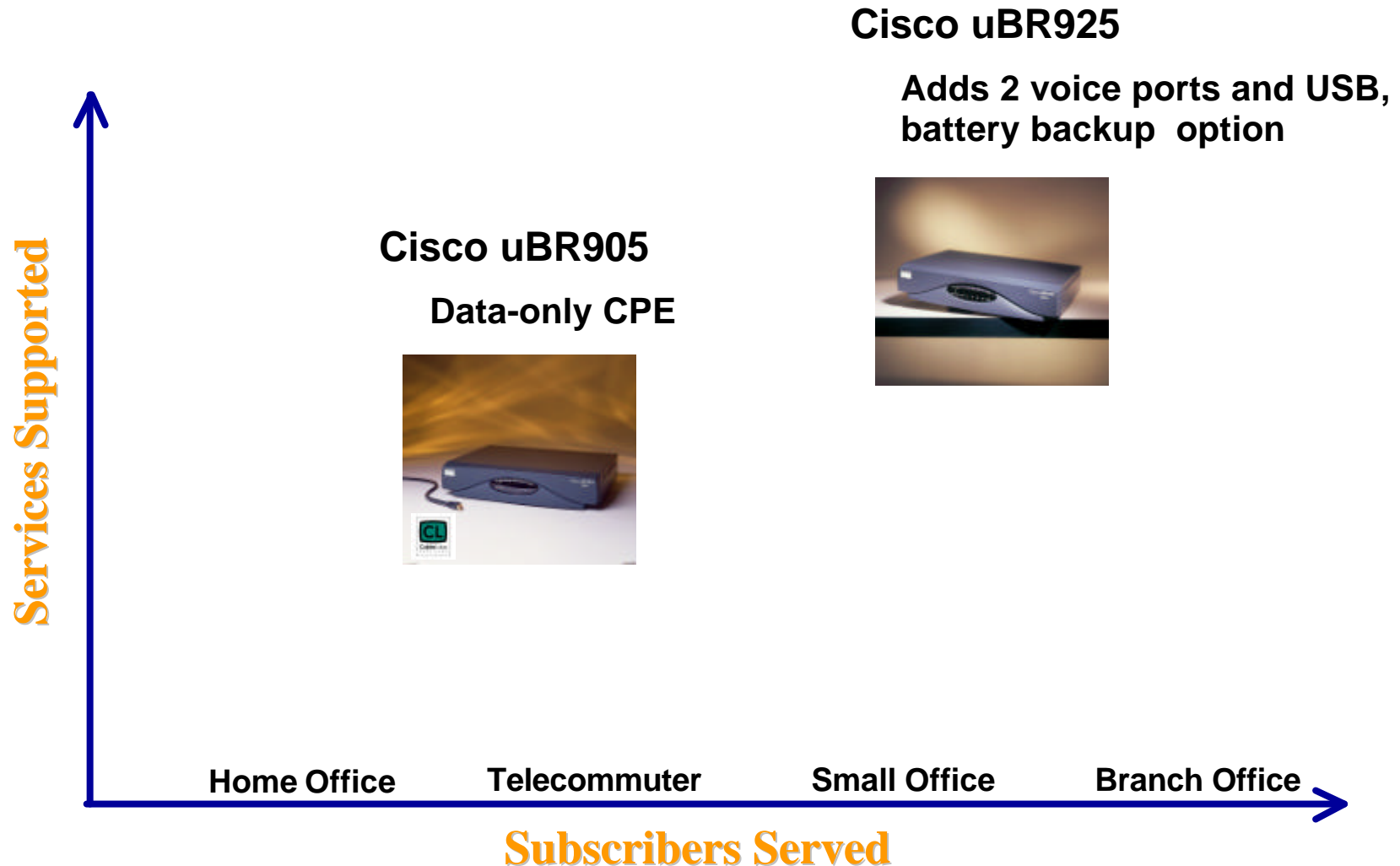


uBR925



CPE Products — Enabling Commercial Services

Cisco.com



Key Features, Roadmaps





Cisco uBR7100
Cisco uBR7200
Cisco uBR10012

Cisco uBR7100

Cisco.com



New *fixed-configuration* CMTS for emerging MxU, hospitality, educational, & smaller distribution hub deployment

-  **Superior Value** – Lowest cost of entry per subscriber* of **any** broadband access technology (Cable, xDSL, Wireless, etc.)
-  **Highest integration** – CMTS + edge routing + upconverter + Cisco IOS = capital & operational savings
-  **Richest connectivity** – 2 embedded FE ports + over 15 optional LAN/WAN interfaces starting from T1 up to OC3
-  **Most versatile deployment** – Only true integrated CMTS & Internet Router + 2-way RF and 1-way Telco Return traffic support

Cisco uBR7111 with Cable Modems — Hotel Deployment

Highly cost-effective

One single CMTS for the whole property – up to 250 rooms

No need for rewiring

Standards-based

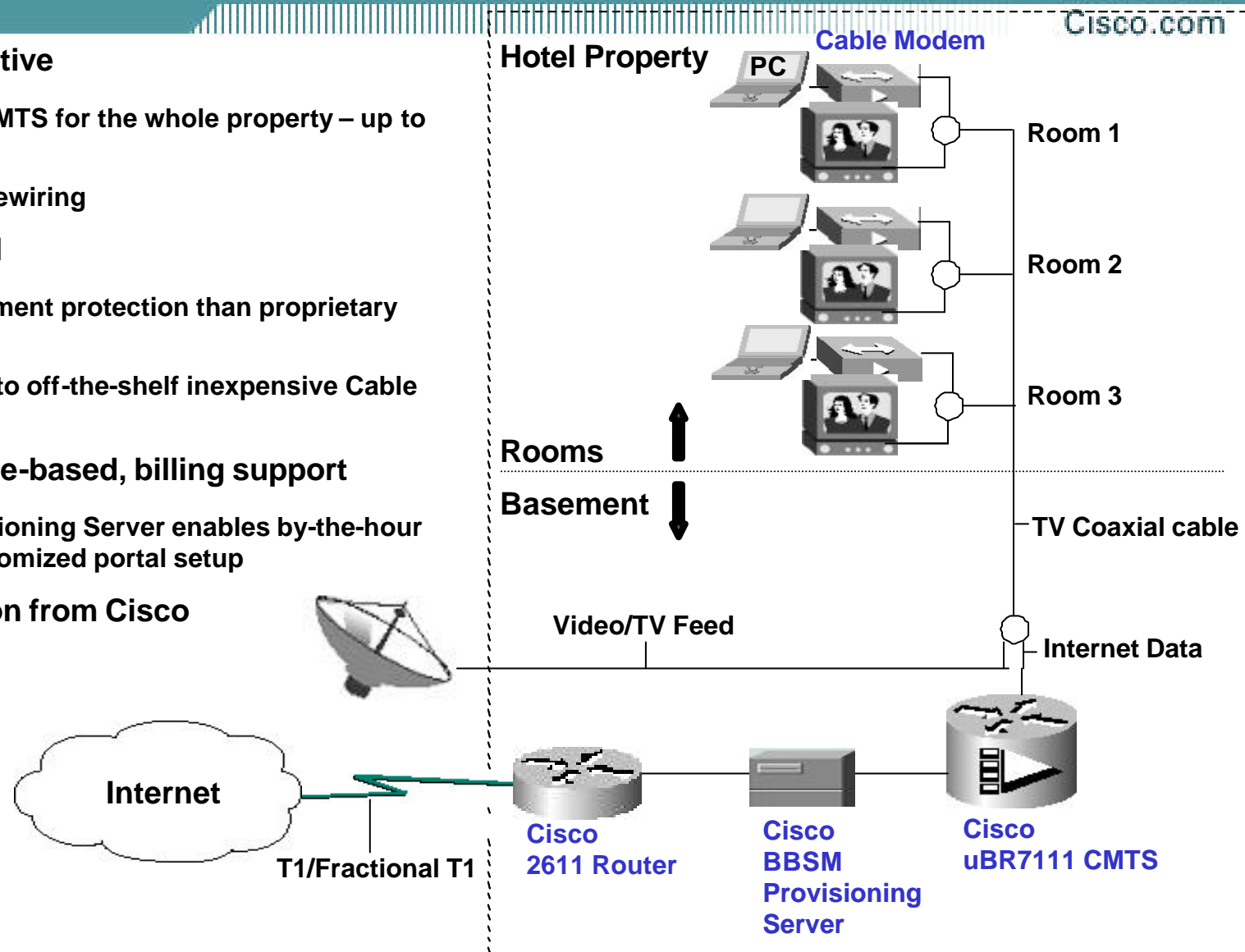
Better investment protection than proprietary solutions

Wide access to off-the-shelf inexpensive Cable Modems

Flat-rate, or usage-based, billing support

BBSM Provisioning Server enables by-the-hour billing & customized portal setup

Complete solution from Cisco



Key Features, Roadmaps

Cisco uBR7100
Cisco uBR7200
Cisco uBR10012

DOCSIS 1.1
Qualified

Cisco uBR7246VXR

Cisco.com

Key Features Shipping Today

- **Modular Scalability**

Highest rack density and capacity

Fully upgradable processors and line cards

Sufficient current capacity plus guaranteed expansion path

- **High Availability (HA)**

Exceeds PacketCable High Availability requirements—1+1

A proven track record with millions of hours of uptime

Redundant power, service-transparent insertion and removal of cards

- **Lowest Cost of Ownership**

Leverages the current HSD infrastructure

Multiple standards—IETF, ITU, DOCSIS, PacketCable, MPLS, RPR/DPT

Industry's only robust provisioning and management



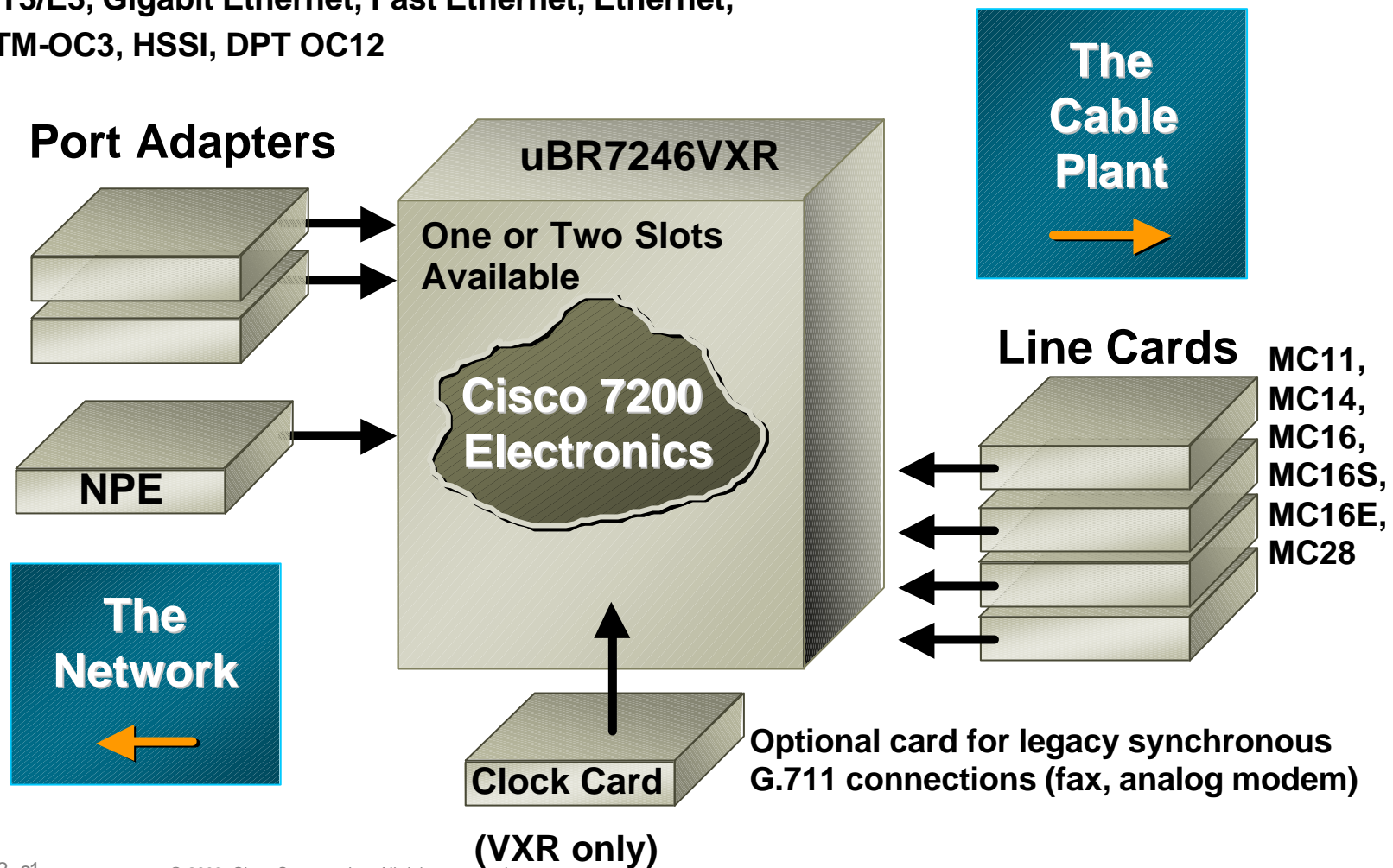
**DOCSIS 1.1
qualified**

Cisco uBR7246VXR

Cisco.com

LAN/WAN Interfaces:

T1/E1, T3/E3, Gigabit Ethernet, Fast Ethernet, Ethernet,
PoS/ATM-OC3, HSSI, DPT OC12

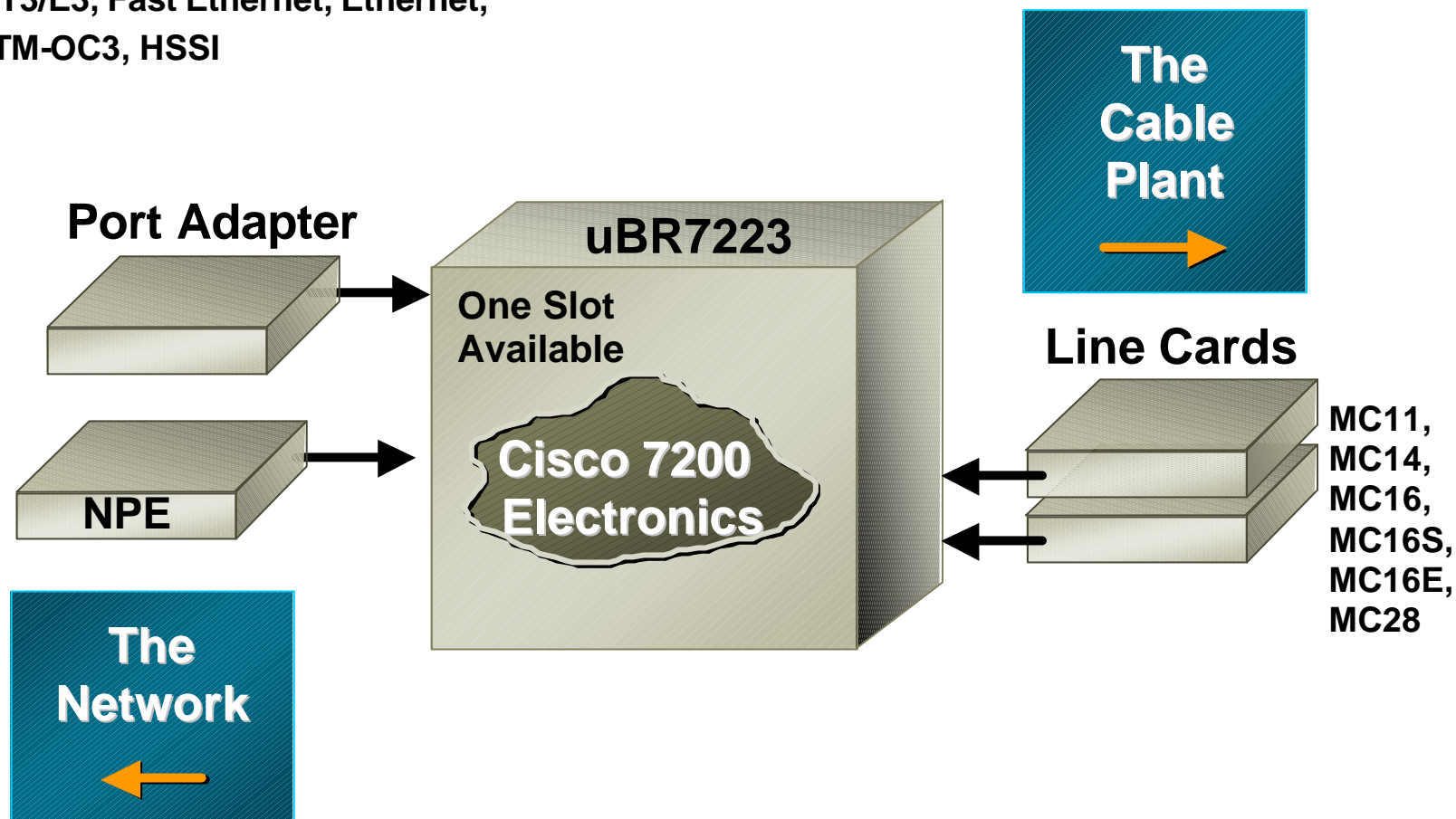


Cisco uBR7223

Cisco.com

LAN/WAN Interfaces:

T1/E1, T3/E3, Fast Ethernet, Ethernet,
PoS/ATM-OC3, HSSI



Cisco uBR7200 Series — Line Cards Summary

Cisco.com

| Line Card | Upstream Ports | Downstream Ports | Feature Differentiator |
|--------------------------|----------------|------------------|---|
| uBR-MC28C | 8 | 2 | Highest port density of current cards (supports dual 1x4 downstream-to-upstream port ratio); DOCSIS (Annex B) |
| uBR-MC28C-BNC | 8 | 2 | BNC connectors instead of F-connectors; Highest port density of current cards (supports dual 1x4 downstream-to-upstream port ratio); DOCSIS (Annex B) |
| uBR-MC16S | 6 | 1 | Software & hardware spectrum management enhancements DOCSIS (Annex B) |
| uBR-MC16E | 6 | 1 | EuroDOCSIS (Annex A) support |
| uBR-MC16C | 6 | 1 | DOCSIS (Annex B) |
| uBR-MC14C | 4 | 1 | DOCSIS (Annex B) |
| uBR-MC12C EOL* | 2 | 1 | DOCSIS (Annex B) |
| uBR-MC11C | 1 | 1 | Cost-effective market entry for one-way cable plants; DOCSIS (Annex B) |
| uBR-MC28J (proto) | 8 | 2 | J-DOCSIS (5-55 MHz Annex B) for Japan |

Cisco uBR7246VXR

Cisco.com

Recent Enhancements

- **Enhanced performance**
NPE-400
- **Carrier class availability**
1+1, PacketCable HA
- **Advanced spectrum management**
MC16S s/w updates, interface to Acterna spectral display application
- **New services and software features**
DOCSIS 1.1, MPLS VPN
- **Management features**
Cisco Cable Manager 2.2, Broadband Troubleshooter 2.2, Network Registrar 5.5, Address and Name Registrar, Broadband Provisioning Registrar
- **Increased versatility**
New I/O controller, new port adapters, line card BNC connectivity

Cisco uBR7246VXR

Cisco.com

CY '02 and CY '03 Enhancements

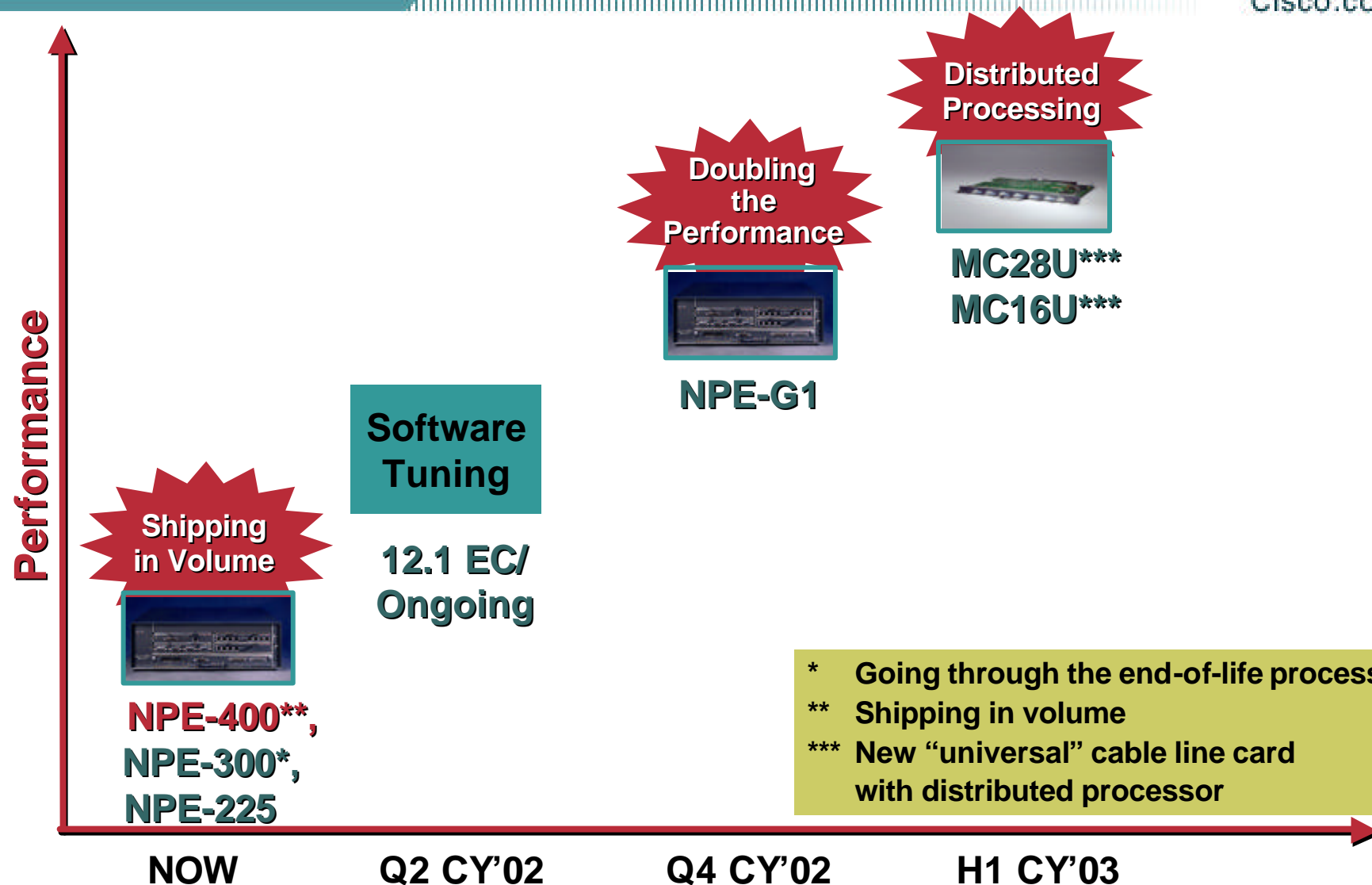
- **Enhanced performance**
S/w performance tuning, NPE-G1, Universal line cards
- **Carrier class availability**
N+1/RF switch
- **Universal* functionality**
MC28U, MC16U line cards
- **New services and software features**
PacketCable Voice**, DOCSIS 2.0 (A-TDMA initially)
- **Management features**
Cisco Cable Diagnostic Manager, Resource Manager Essentials for Cable, Cisco Cable Manager 2.3+, CBT 2.3, Enhanced Cisco Network Registrar
- **Increased versatility**
Continued support for new port adapters

* Details in a later slide

** DQoS, CALEA, Event Messaging

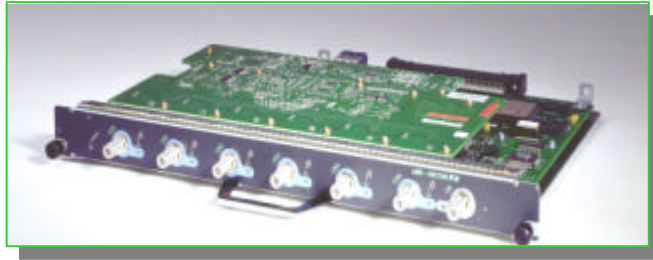
Cisco uBR7246VXR — Scaling Performance over Time

Cisco.com



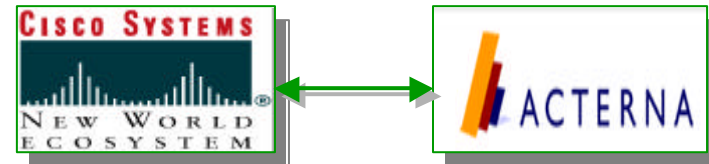
uBR-MC16S Line Card — Advanced Real-Time Spectrum Mgmt.

Cisco.com



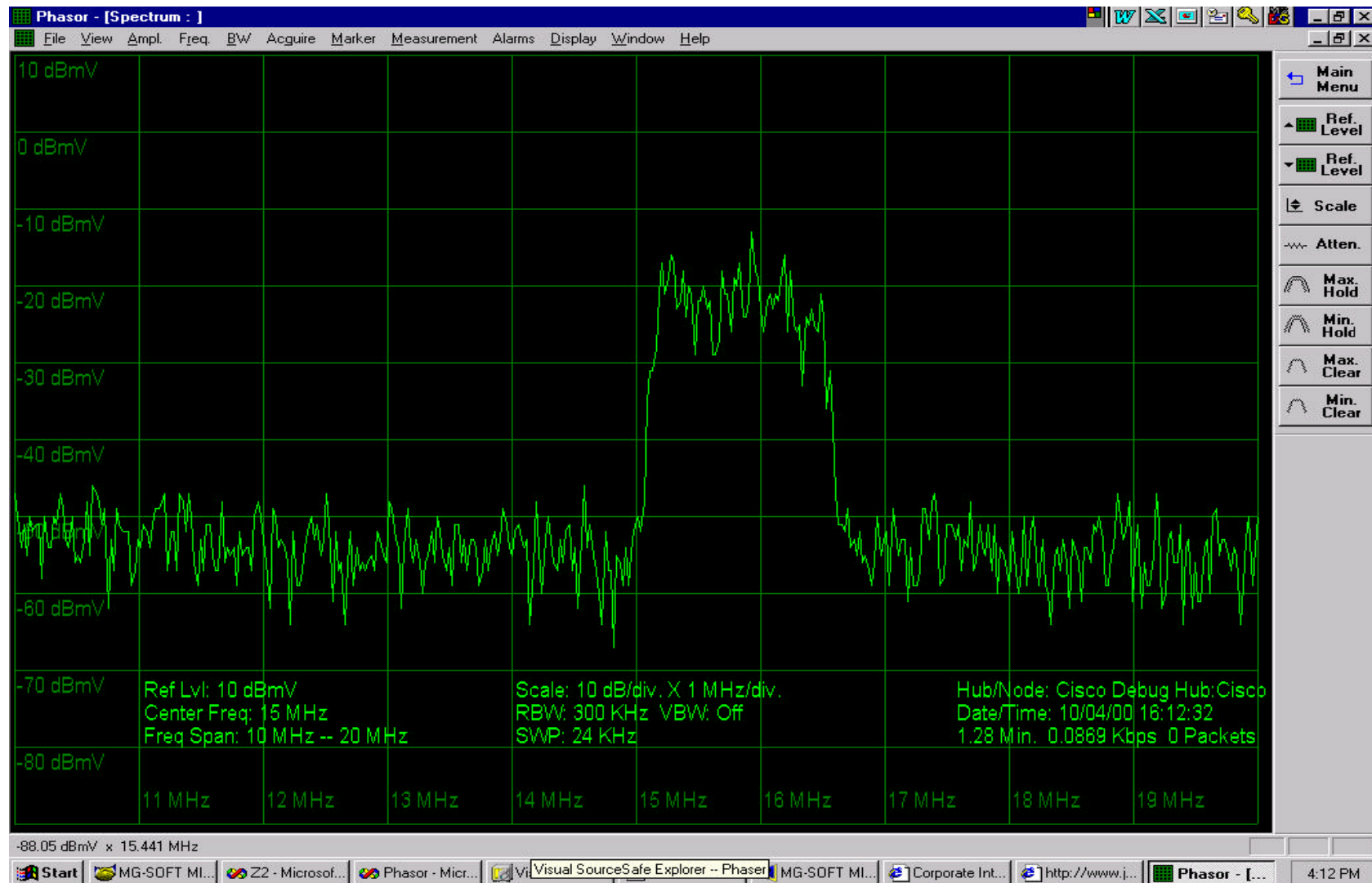
uBR-MC16S – Integrated spectrum analyzer

- Pro-active channel mgmt features include:
 - Intelligent frequency hopping w/ advanced look-ahead
 - Dynamic upstream modulation change
 - Dynamic channel width adjustment
 - Dynamic power level adjustment
 - Selectable hop priorities based on C/N, FEC counters, or % modems on-line
 - SNMP interface to 3rd party tools through CISCO-CABLE-SPECTRUM-MIB
 - Basic capabilities also available for MC1xC/16E/28C
- Diagnose CM problems and measure ingress noise on CMTS upstream ports & individual CMs
 - Proactively reduce customer outages and mean-time-to-repair
 - Increase availability of the return path spectrum
 - Prevent service interruptions through pro-active channel management
 - Get near-real time spectrum display through Acterna DOCSIS Cable Modem Test Analyzer (DCMTA) from remotely
 - Add new subscribers with confidence



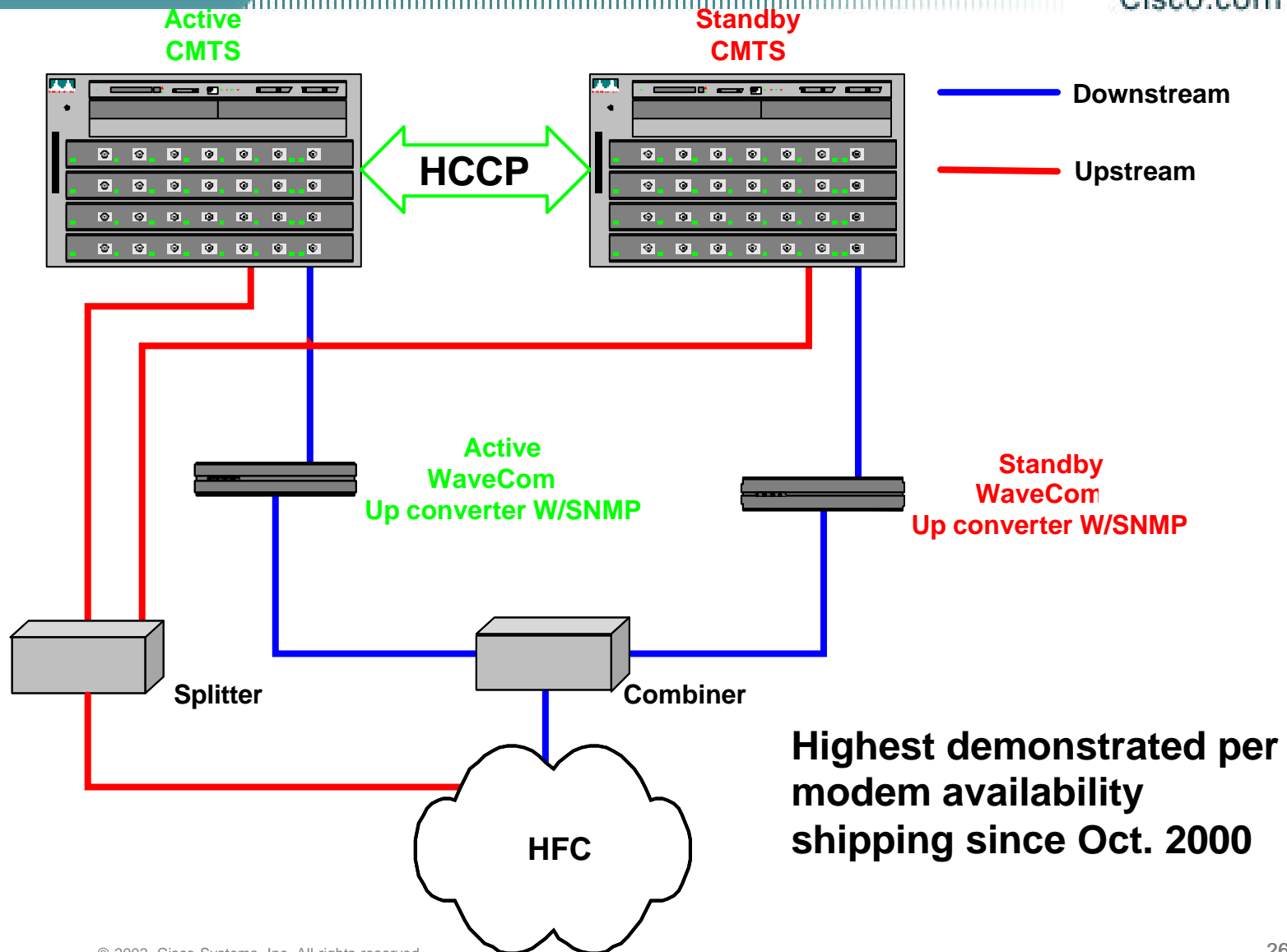
Acterna DOCSIS Cable Modem Test Analyzer (DCMTA)

Cisco.com



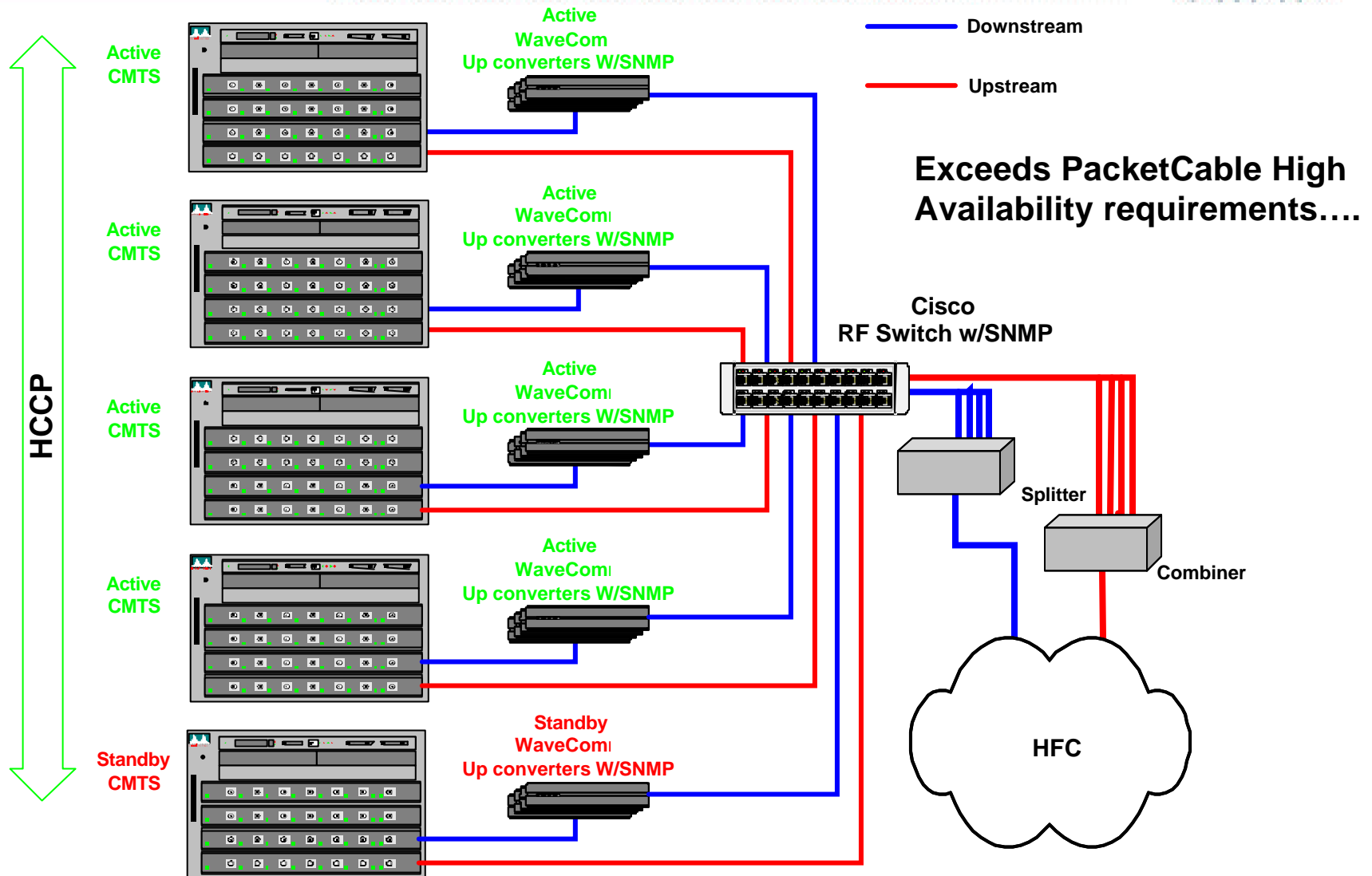
Cisco uBR7246VXR — 1+1 Redundancy without RF Switch

Cisco.com



Cisco uBR7246VXR — N+1 Redundancy With RF Switch

Cisco.com



Key Features, Roadmaps

Cisco uBR7100
Cisco uBR7200
Cisco uBR10012

**DOCSIS 1.1
Qualified**

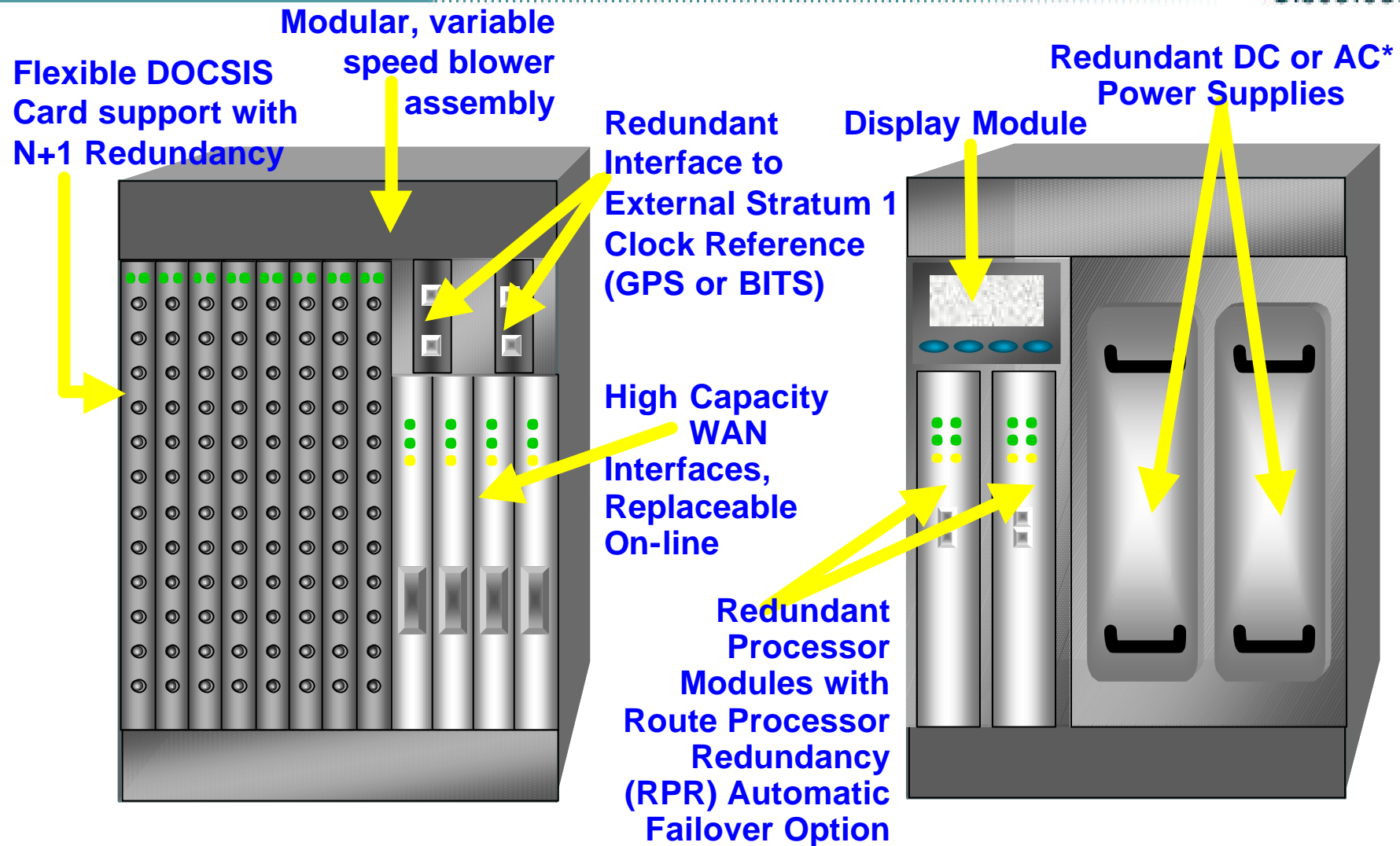
Cisco uBR10012 — Key Features

Cisco.com

- **Maximum Throughput With All Services Running**
Massive parallel processing maintains performance under load
Centralized and distributed processor architecture
- **Modular Scalability**
Sufficient current capacity plus guaranteed expansion path
Open development path to high density, DOCSIS 2.0, Video over IP
- **High Availability**
Leverages proven VXR line card technology and stable software
Full hardware redundancy, external line card switching
- **Fully featured to support HSD, Biz, Open Access, VoIP**
Four years of cable code development plus full IOS leverage
100% hardware redundancy, external 1xN line card switching
Industry's only robust provisioning and management

Cisco uBR10012 — Front and Back Views

Cisco.com



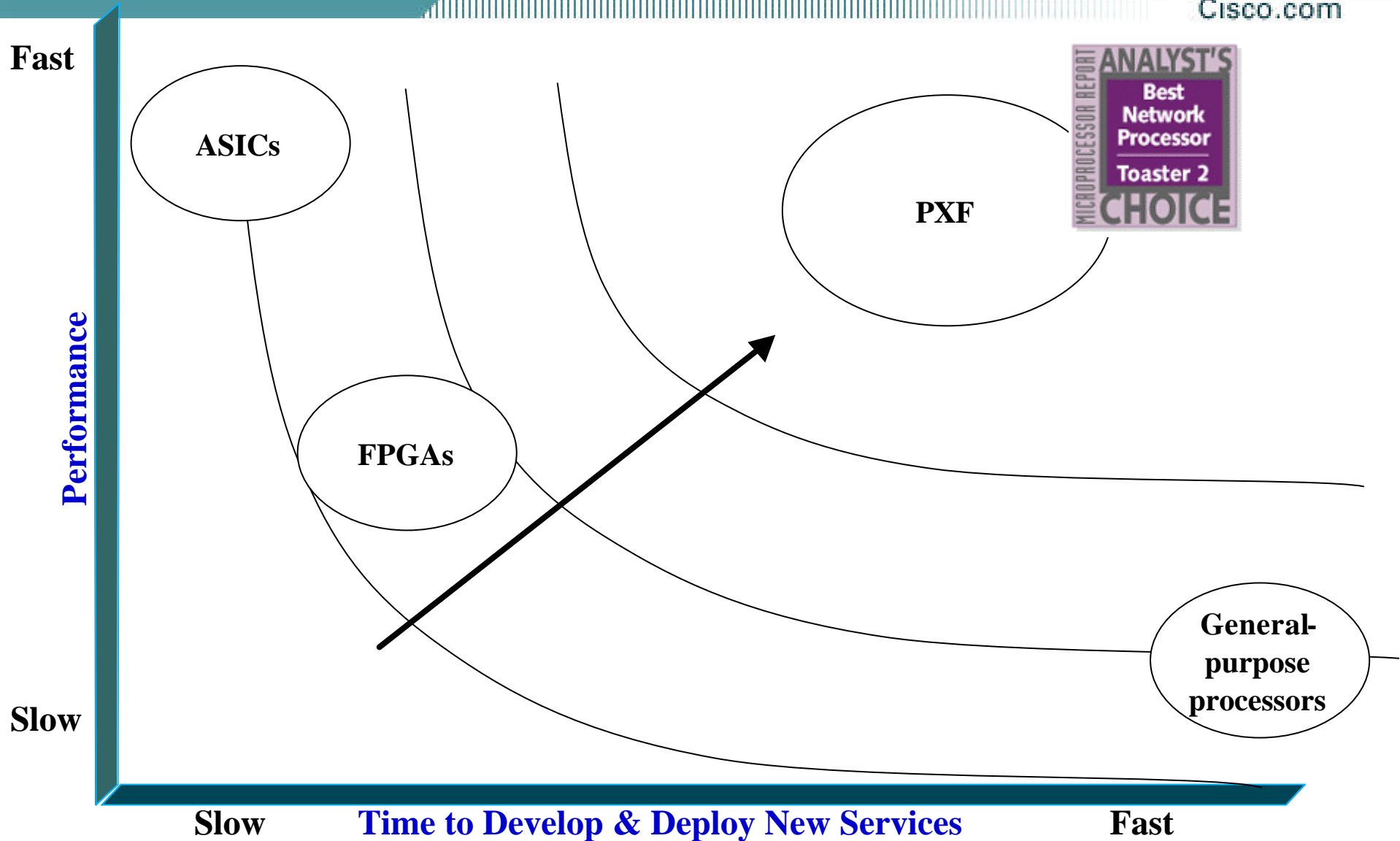
* AC Internal Modules available H1 CY02

Cisco.com



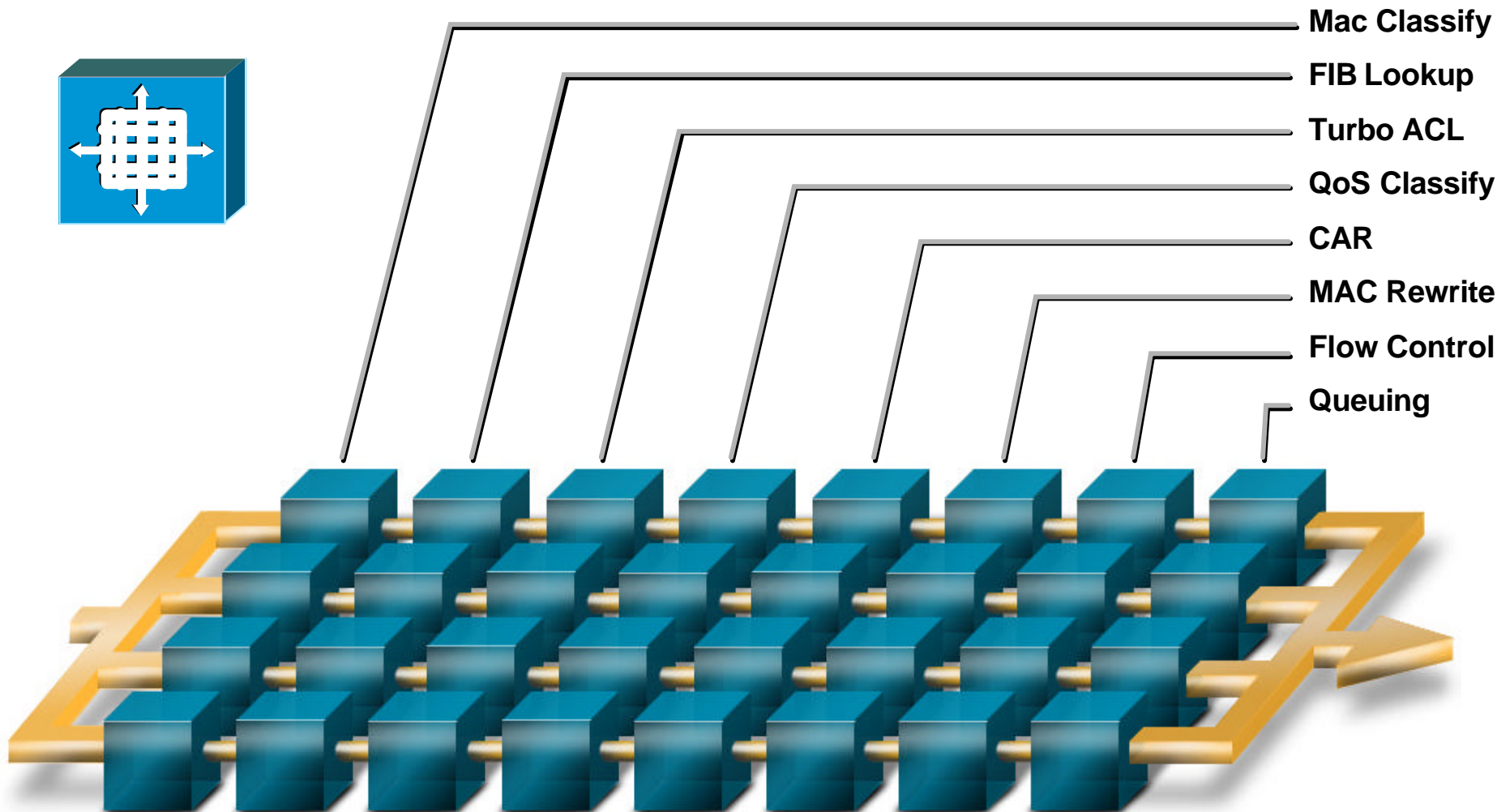
Parallel Express Forwarding (PXF) — Near-ASIC Performance With Near-S/W Flexibility

Cisco.com



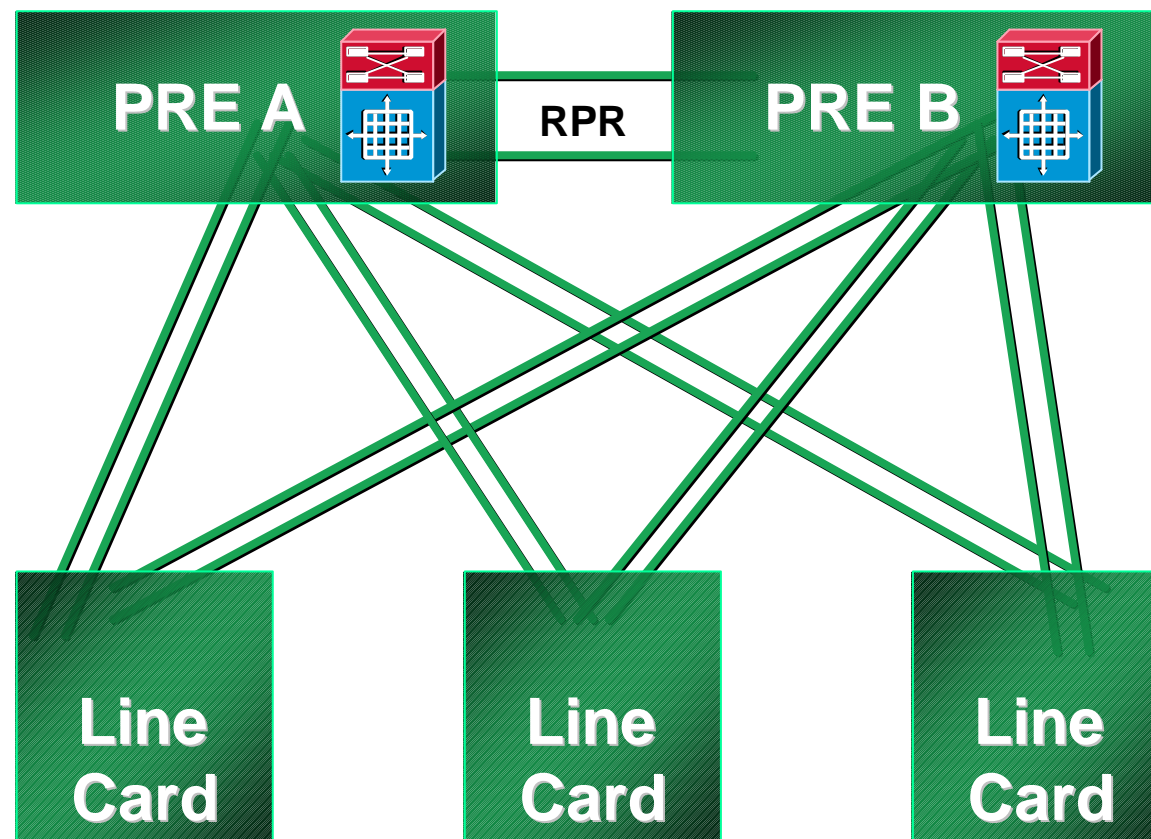
Power of PXF — Parallel Processing

Cisco.com



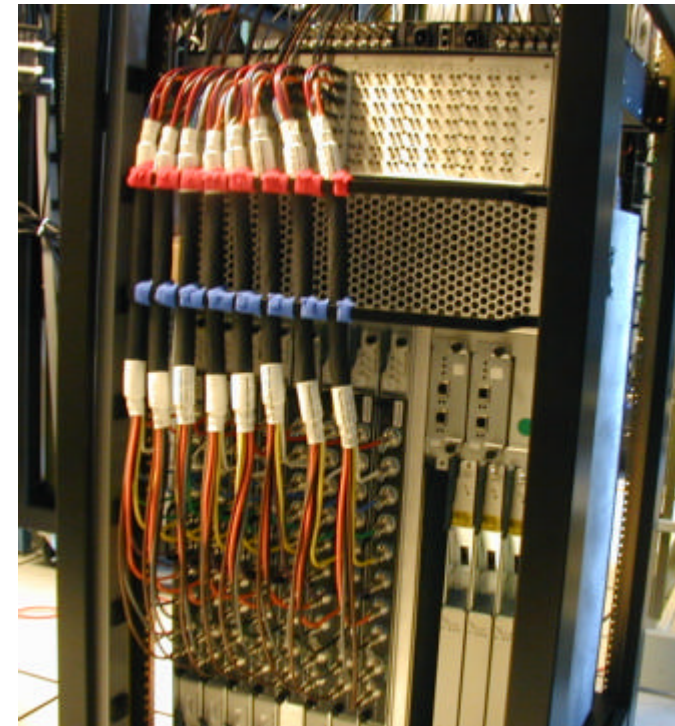
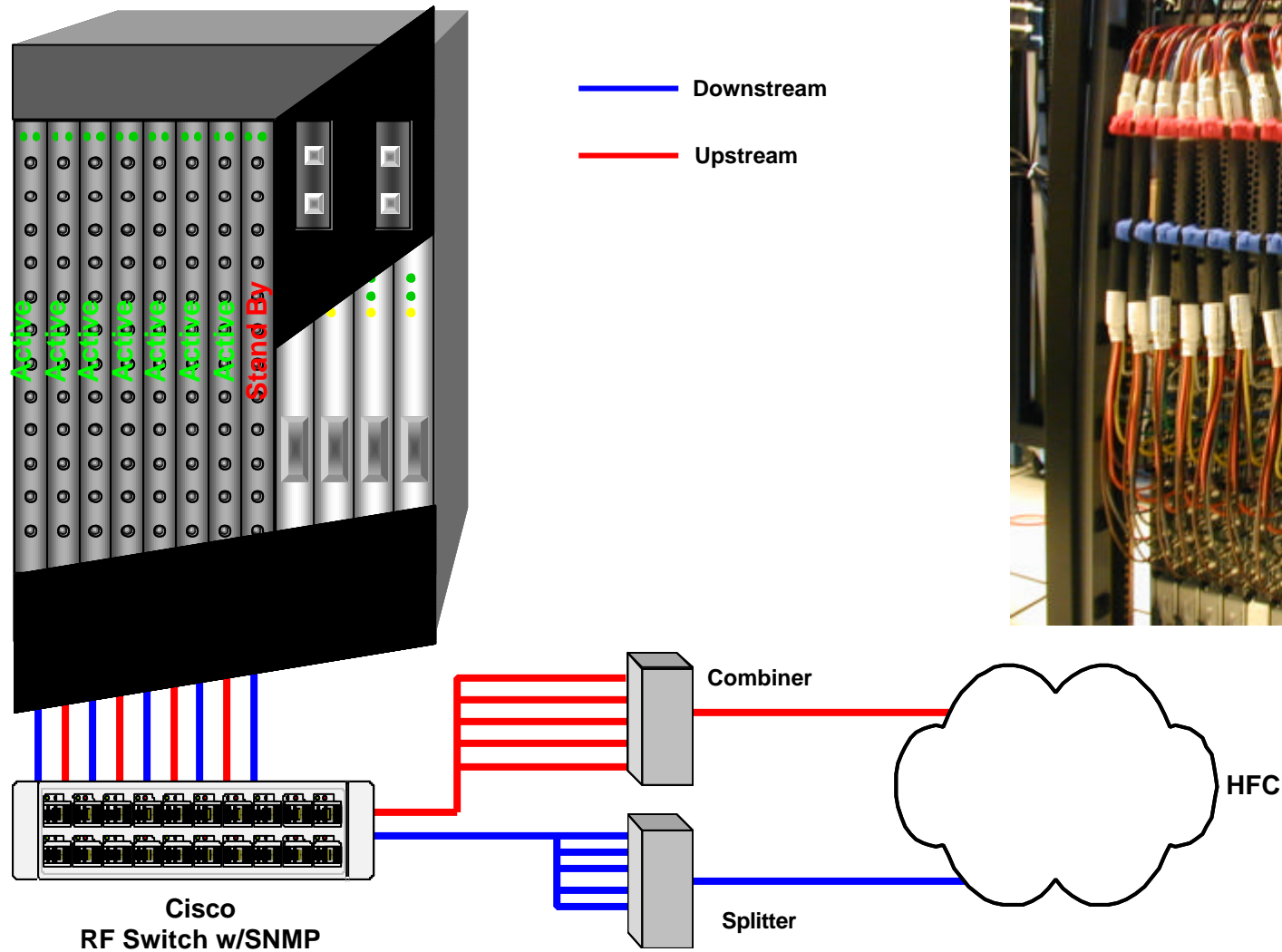
Fully Redundant Point to Point Connections

Cisco.com



Cisco uBR10012 — N+1 Redundancy

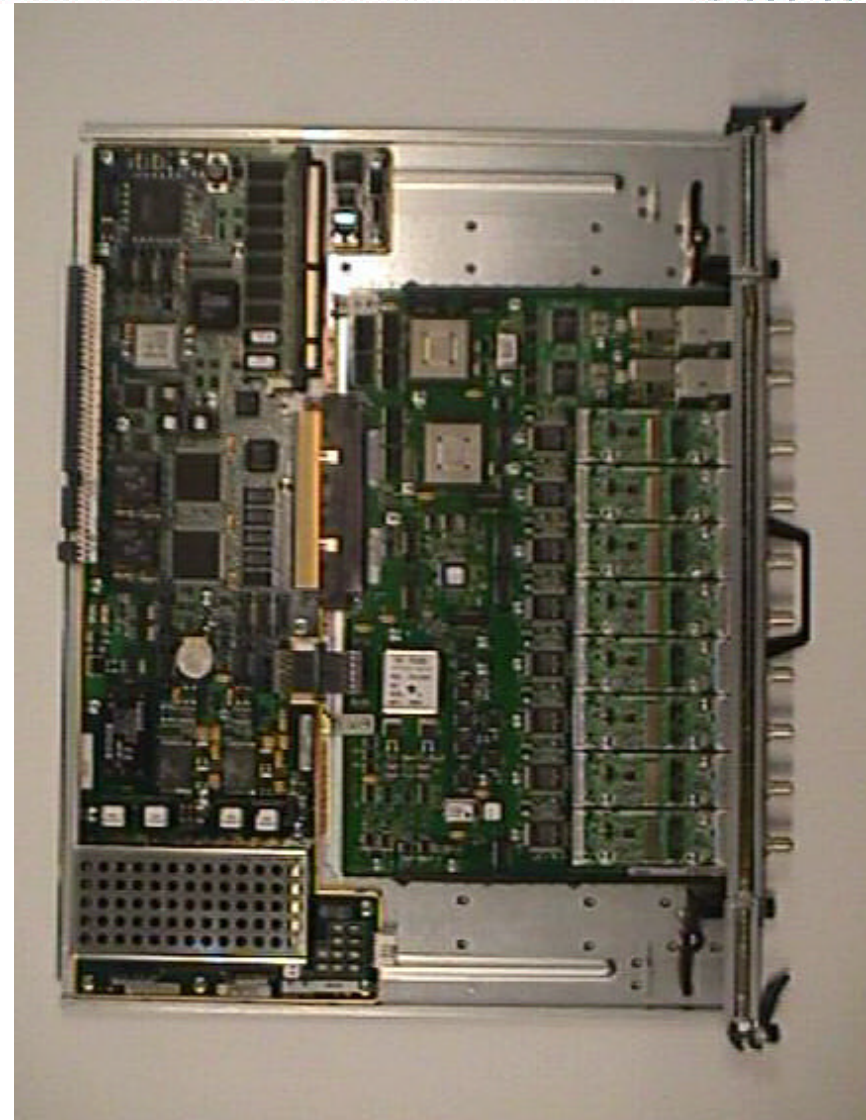
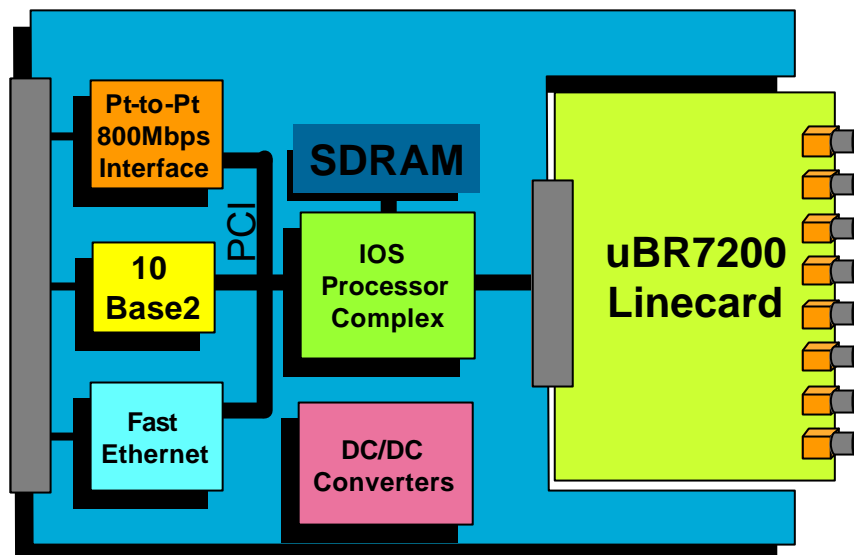
Cisco.com



Cisco uBR10012 — Investment Protection Thru Line Card Re-use

Cisco.com

















- Local NPE-equivalent processor
- Allows reuse of uBR7200 Series line cards in uBR10012 (MC16C, M16S, MC16E, MC28C)



Summary

Cisco Systems: Complete Product portfolio for the Cable Industry

Cisco.com

| Home & Biz | dHub or Head End | Head Ends, Regional and Core Rings/Transport | | Data/VoD/VoIP Center |
|---|---|--|--|--|
| P A R T N E R P R O D U C T S |  uBR10012  uBR7246VXR  uBR7223  uBR7100 | <div>IP</div>  10700  12416 12410 12406 12404 | <div>Gig-E</div>  7603 7606 7609 |  CSS 11000, CE 5xx, PIX 5xx, Cat 6000, Cat 4000, Cat 3000 <div>Voice Overlay Products</div>  MGX 8850 BTS 10200 <div>Provisioning/Management</div> <div>CSRC-BPR, ANR, CNR</div> |
| | | <div>SONET/SDH</div>  ONS 15454 15327  | <div>DWDM</div>  ONS 15540  ONS 15252  ONS 15216  ONS 15201  ONS 158XX | |

Why Cisco?

Cisco.com

Cisco is uniquely qualified to build large-scale Cable IP Networks capable of delivering multiple services...

- **The Cable IP Network is the key to converging today's separate voice, video and data networks and enabling deployment of new services quickly and in massive scale**
- **We have a full suite of Cable IP products & solutions that extends from the core of the network to the subscriber**
- **We have the only Cable IP products that embed maximum intelligence at the edge of the network**
- **We have the expertise, & we provide customers with the support they need to deploy & operate Cable IP networks**

Thank You

