

**CISCO SYSTEMS**



# **Cable PacketVoice**

**Chris Maloney**

**Senior Manager**

**Cable Systems Engineering**

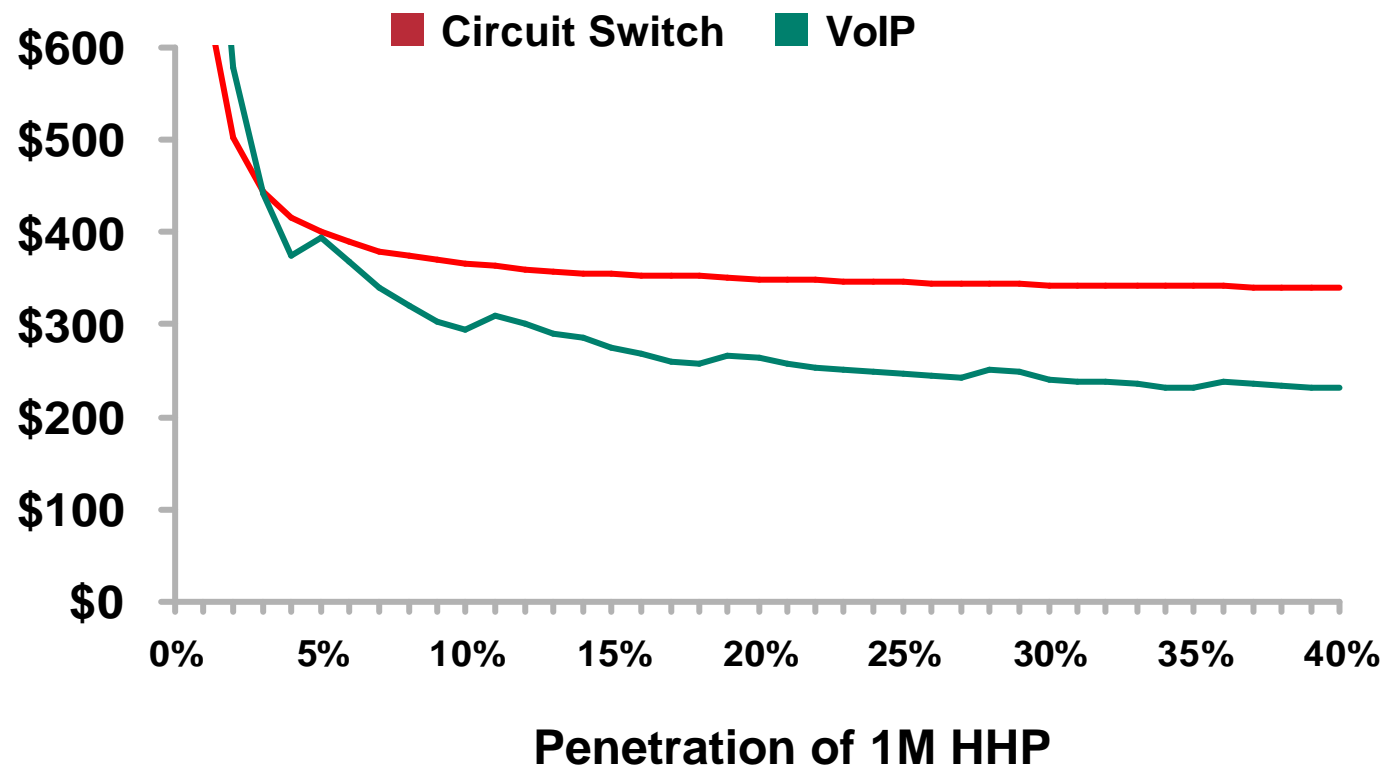
**Cmaloney@cisco.com**

# Why Voice over IP?

# IP Generates Capital Savings

Cisco.com

## Capex\* per Voice Line



\* Incremental to Data Network

# IP Equipment and Moore's Law

Cisco.com



# IP Generates Operational Savings

Cisco.com

- **Separate (voice and data) networks require**
  - Separate network engineering expertise**
  - Separate provisioning**
  - Separate network operations**
  - Separate monitoring and maintenance**

# IP Allows Product Differentiation

Cisco.com

- **Unified communications**
- **Click-to-talk**
- **Find me, follow me**
- **Videoconferencing**
- **Integration with digital video**

# IP Allows Product Differentiation

Cisco.com

- **Unified communications**
- **Click-to-talk**
- **Find me, follow me**
- **Videoconferencing**
- **Integration with digital video**

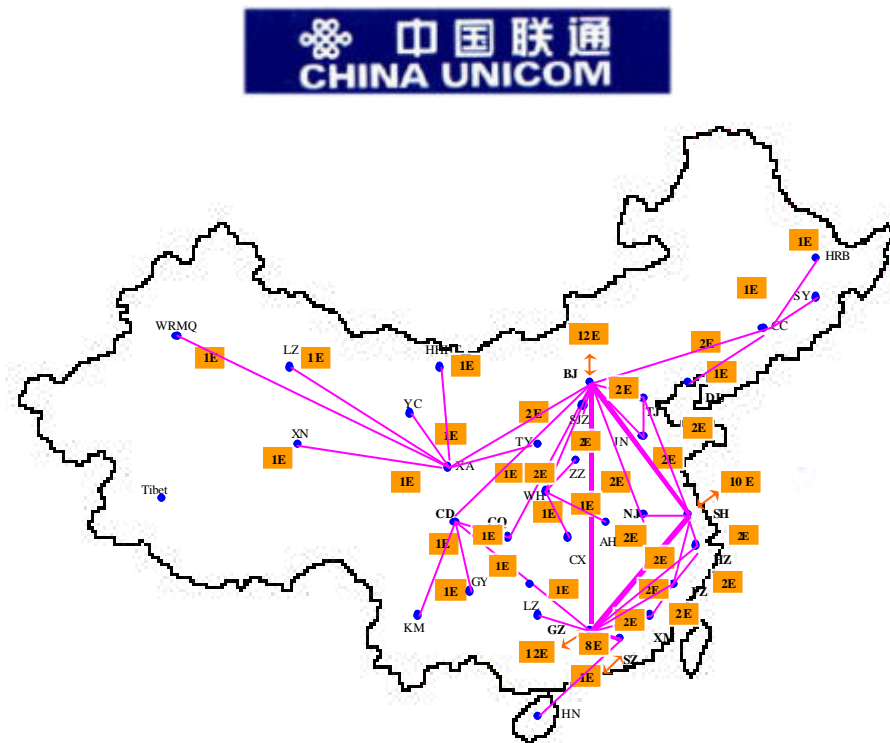


# Cisco VoIP Experience

# Scaling VoIP Networks – China Unicom

Cisco.com

- China Unicom is competitive carrier in China
- Launched VoIP Telephony Service in May 1999
  - Complete transit solution
  - Residential services planned
- Offers both single and two-stage voice services throughout China
- Largest VoIP Network in the world
  - Measured by ports, by MOU, by cities, by gateways

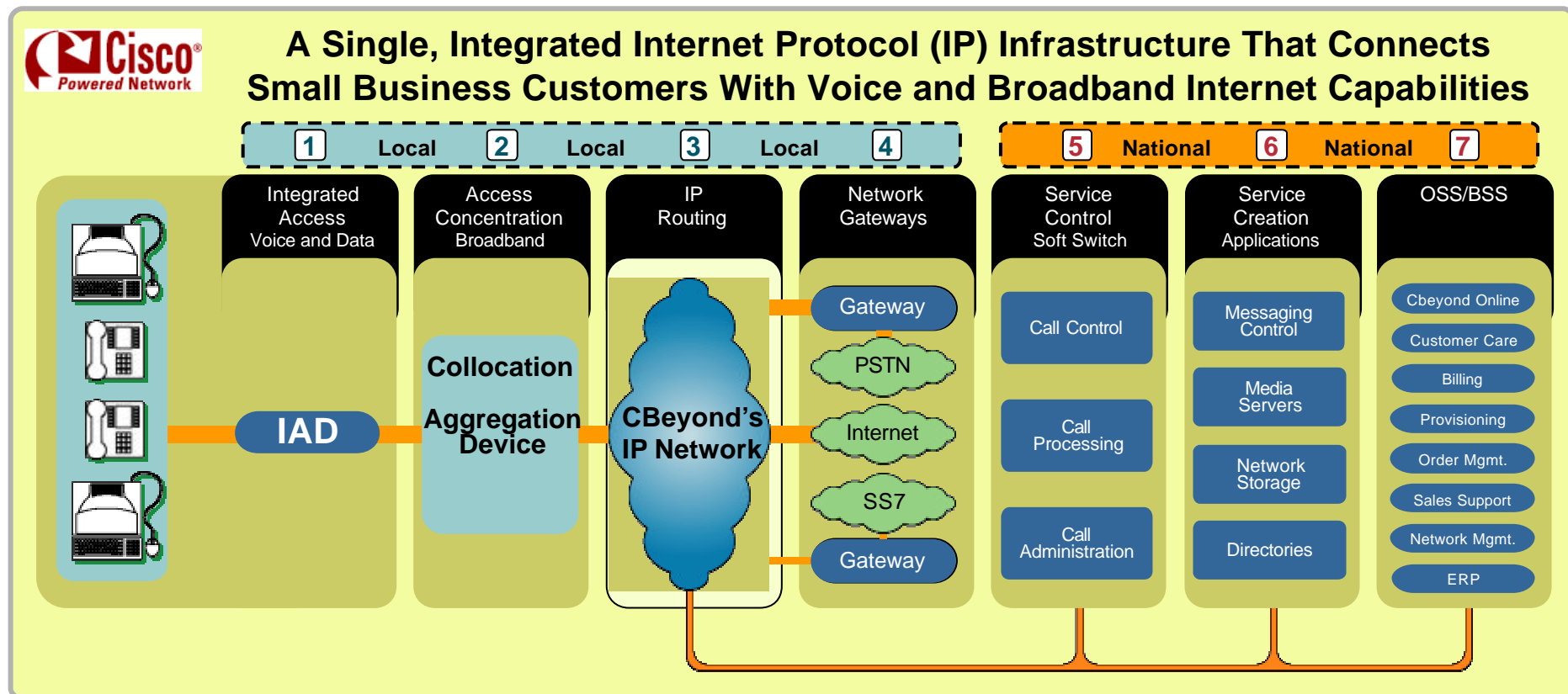


Network Operational in 139 Cities  
On 14,000 E1

# Local Access Service — CBeyond

Cisco.com

- Multi-City CLEC
- BTS Based Local Services Solution
- Voice + Data Business Model
- Cisco 2421 IADs CPE
- Production Network Went Live in 2/2001
- Regulatory Compliant
- SS7/TCAP/LNP A-Link PSTN Interconnect
- MF CAS for 911, E911
- PacketCable NCS for Cable Modem IADs
- Extensive CLASS Features



# Cisco's History in Cable Voice

Cisco.com

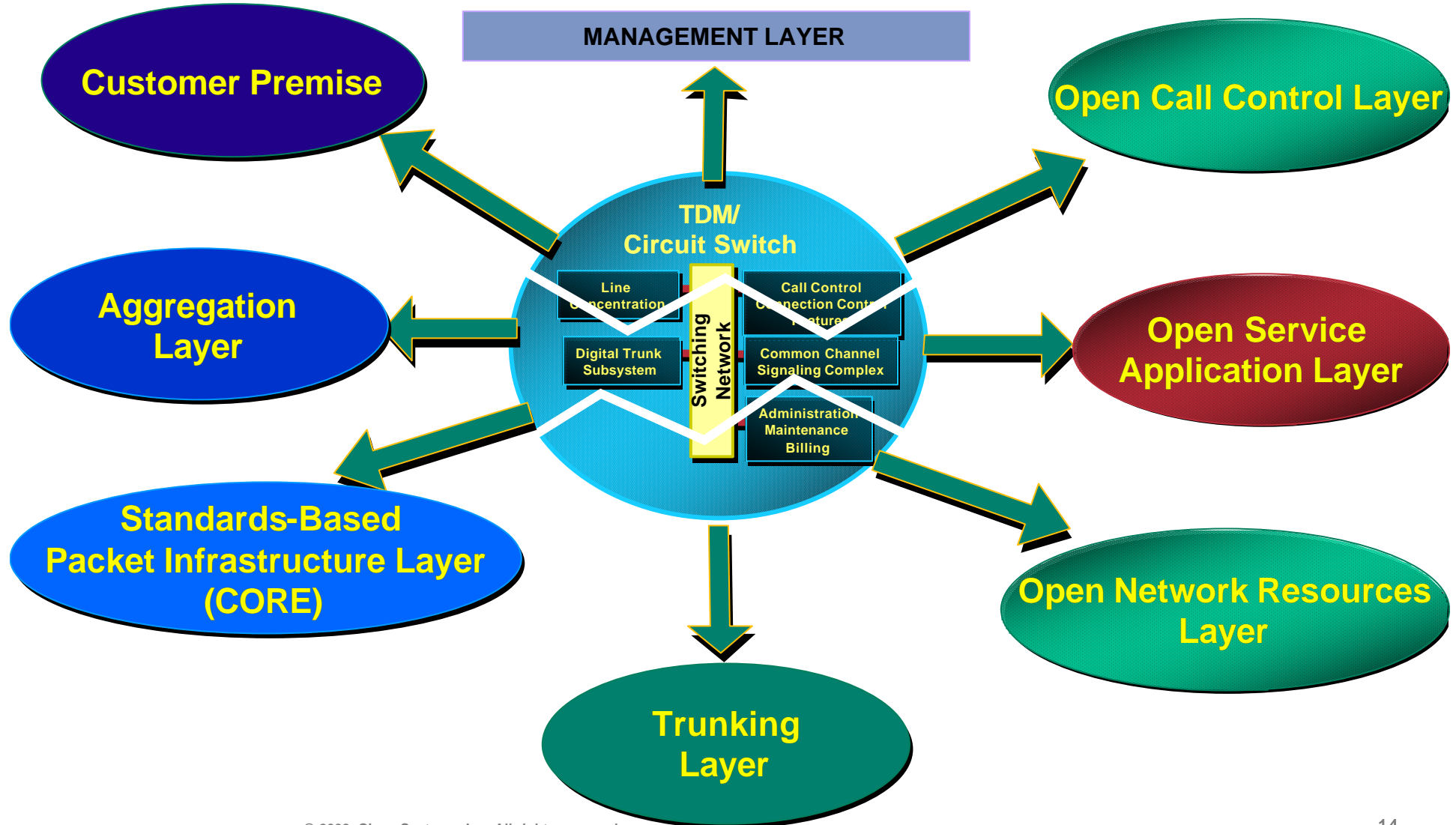
- Cisco began defining, inventing and developing a carrier class VoIP solution for cable in 1998 with Videotron
- Cisco has since been working closely with major MSOs\* across the world to harden its voice products and solutions and integrate the solution with existing Operations
- This experience has given Cisco an unmatched perspective on the requirements, inter-dependencies and challenges of Voice over Cable solutions
- Key areas of focus include:
  - Open, Standards-Based & PacketCable architecture
  - Systems Integration
  - Integrated Management
  - Ongoing Test, Measurement and Tuning

\* AT&T, Cablecom, Cablevision, Charter, PT Telecom, Comcast, ZTV, Time Warner Cable, UPC

# Cisco Cable VoIP Strategy

# Open Packet Telephony

Cisco.com



# Cisco Partner Strategy

Cisco.com

**Combine Cisco products with standards based partner products to provide End-to-End solutions.**

# Cable Telephony Service Levels

Cisco.com

## Additional Line

- **Second Line, Teen Line, Chat Line**
- **Embedded Multimedia Terminal Adapter (EMTA) or Stand-alone MTA (SMTA)**
- **Up Sell to Existing HSD Service**
- **Reliability at 3 9s**
- **Minimal OSS Support**
- **First Step To Primary Line Service**

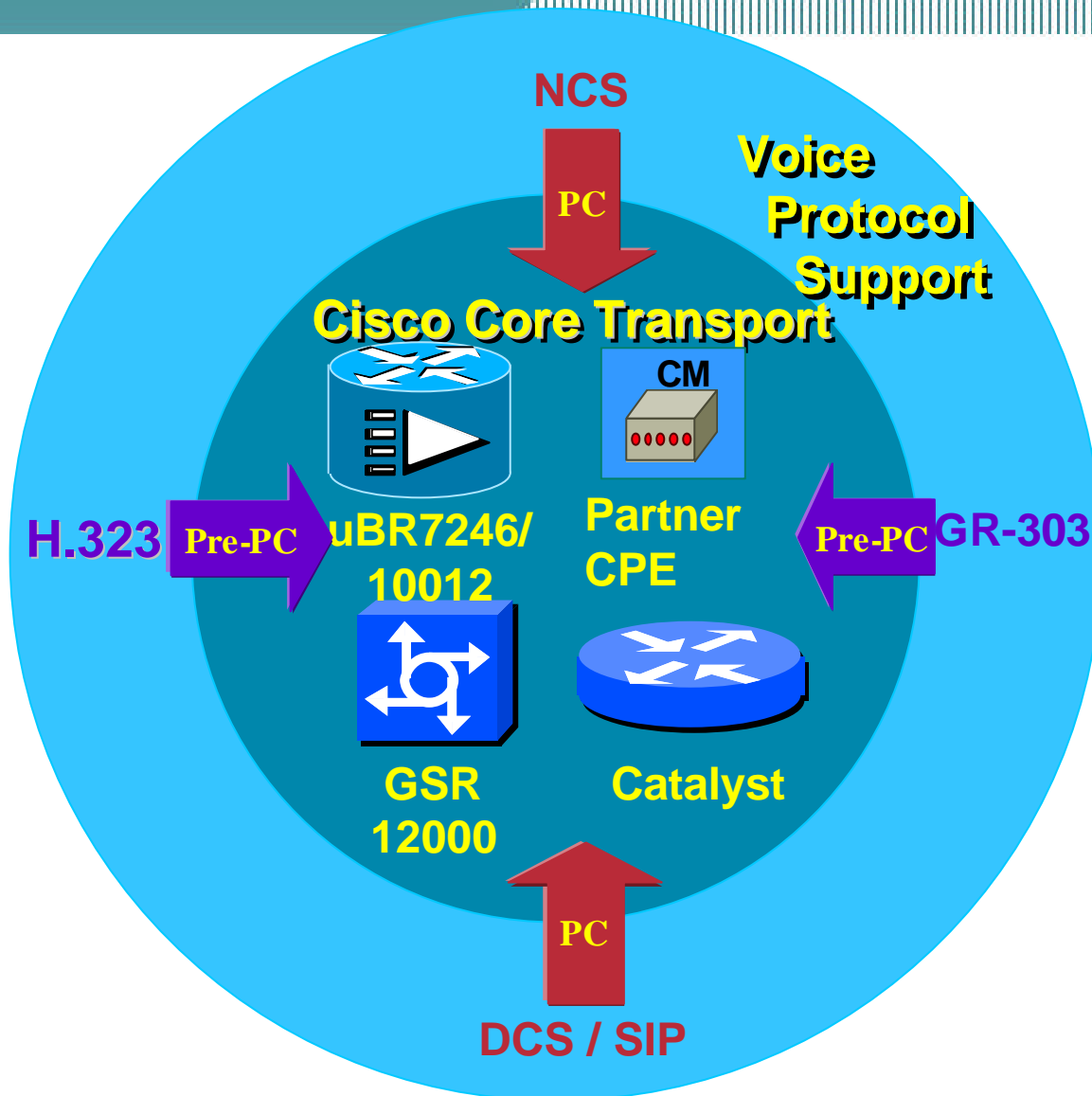
## Primary Line

- **ILEC/PTT Parity**
- **Embedded Multimedia Terminal Adapter (MTA)**
- **Line Powered or Battery Back-Up**
- **Reliability at 4 9s (matching PSTN requirements)**
- **Extensive OSS Support**
- **Full EMS Level Network Mgmt**



# VoIP Protocols

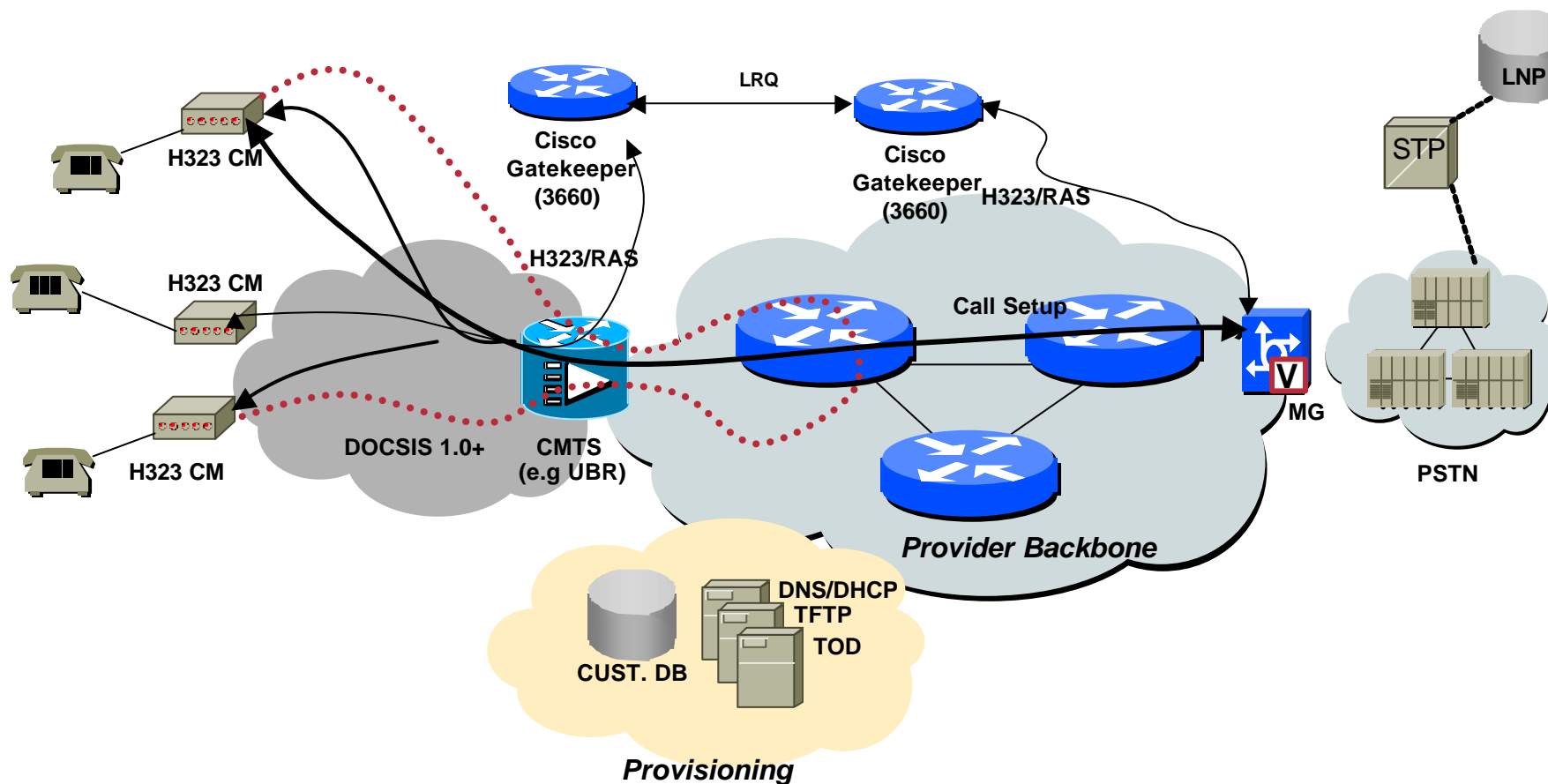
Cisco.com



The VoIP protocols may change, but the core transport network remains the same.

# H.323 Basic Architecture

Cisco.com



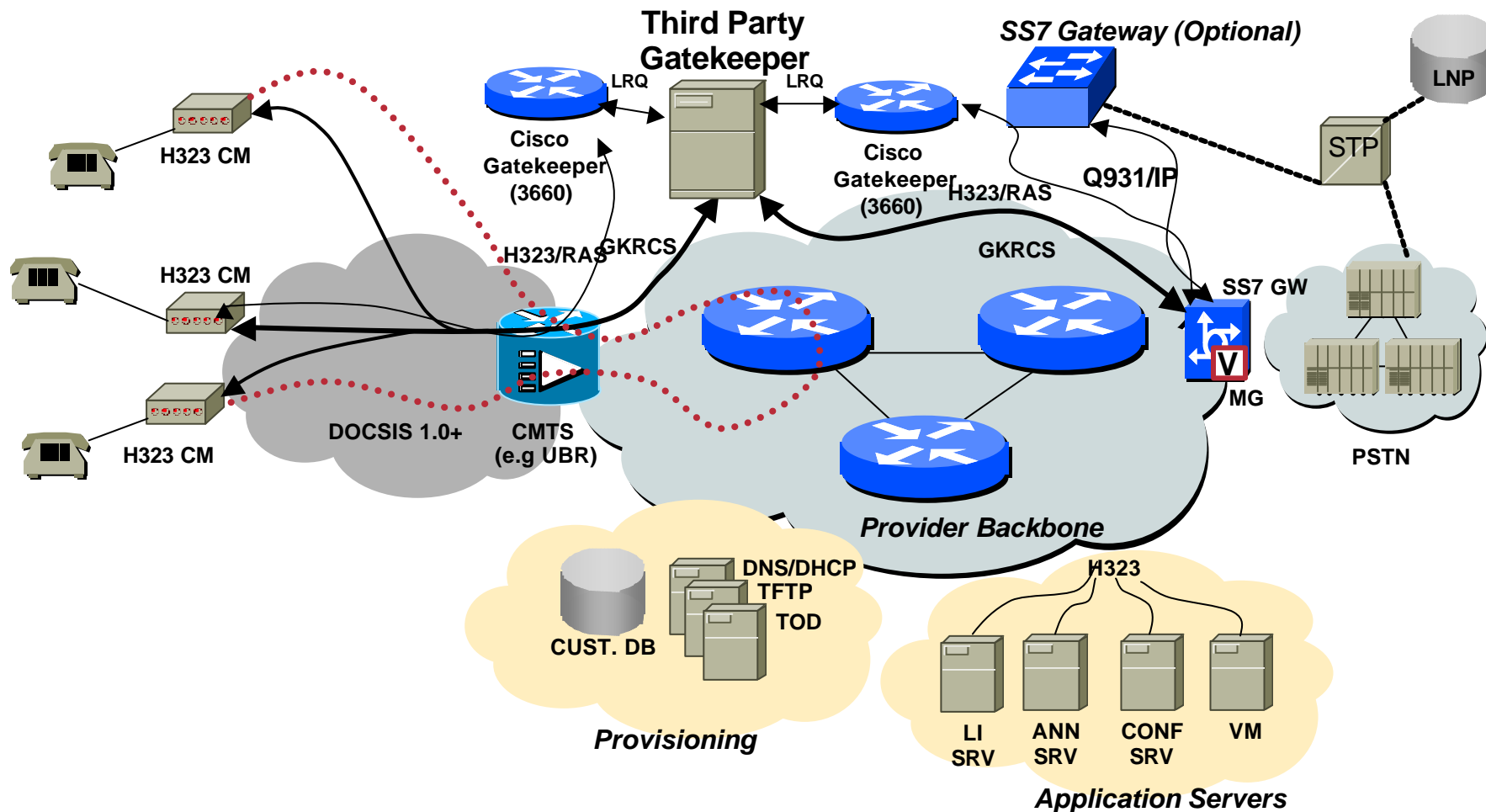
# H.323 Basic Overview

Cisco.com

- **Service Provided:**  
Basic Voice “Dialtone” service.  
On-net and off-net calls.
- **Solution Status:**  
Deployable today
- **Target Market:**  
Developed primarily for international markets.

# H.323 Advanced Architecture

Cisco.com



# Advanced H.323 Overview

Cisco.com

- **Service Provided:**

- H.323 Basic features plus:**

- Call Fwd Line (Busy, No Answer, Unconditional, Variable)

- Call Rejection/Call Blocking with Announcement

- Calling Number Delivery/Blocking

- Distinctive Ringing

- Find Me / Follow Me

- **Solution Status:**

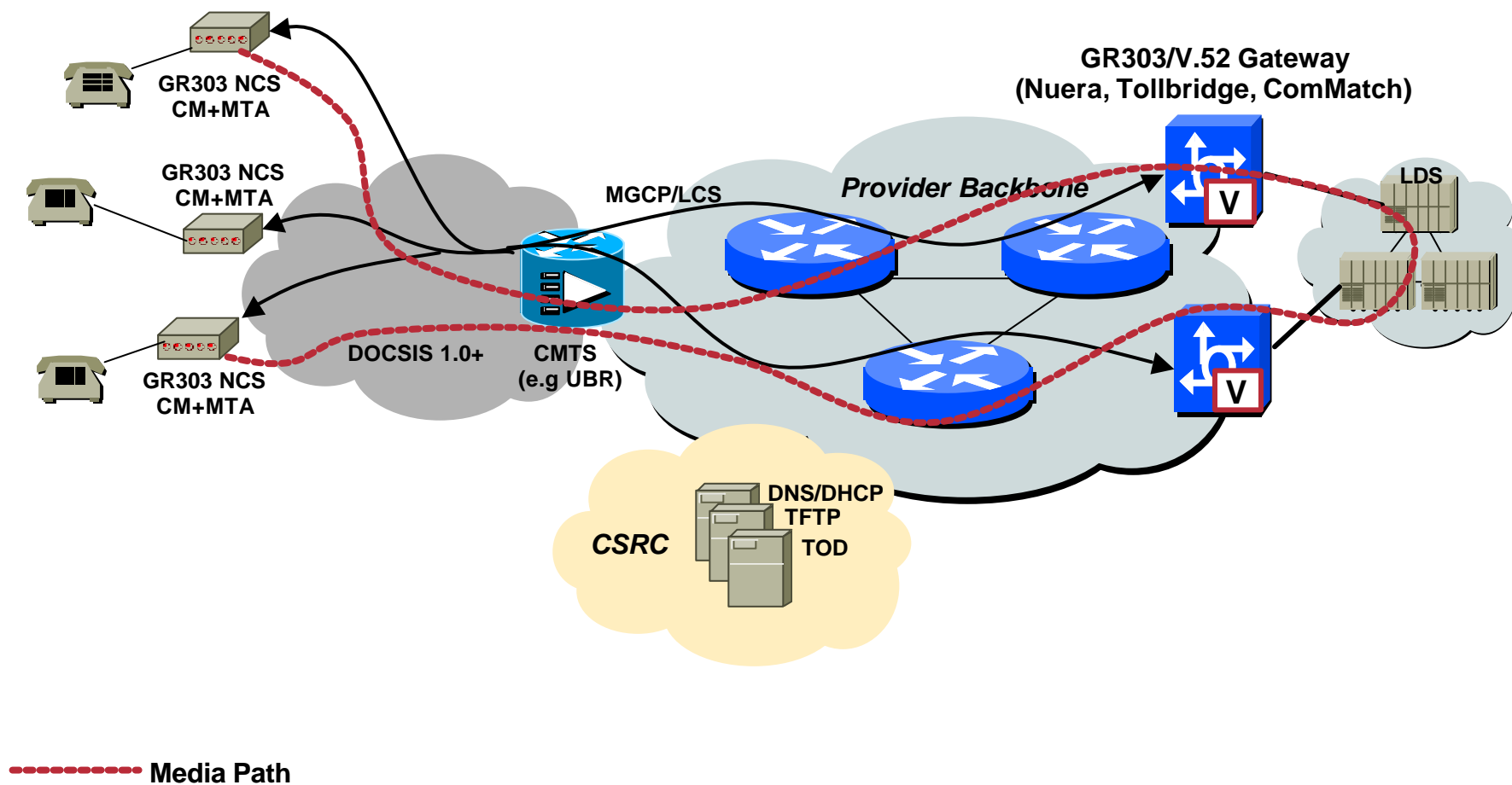
- In trials today

- **Target Market:**

- Developed primarily for international markets.

# GR303/V5.2 Architecture

Cisco.com



# GR303/V5.2 Overview

Cisco.com

- **Service Provided:**  
**“Full” Class 5 Features.**
- **Solution Status:**  
**In trials today**
- **Target Market:**  
**GR303 targeted at North American MSO's with installed base of Switches.**  
**V5.2 targeted at International MSO's with installed base of switches.**

# PacketCable™ /IPCablecomm

Cisco.com

- **Founded in late 1997 to address the need for a multimedia architecture**
- **Requires DOCSIS 1.1 – operates over a DOCSIS 1.1 access network with Cable Modem and CMTS as the core delivery components**
- **Current focus is VoIP Primary-line/Life-line Telephony service**
- **Specifications jointly developed by MSOs, CableLabs® and vendors to address:**
  - Signaling for services**
  - Media transport at variable QoS levels**
  - Security**
  - Provisioning of the client device**
  - Billing**
  - Network Management**
- **Taken as a whole PacketCable Specifications define a complete architecture for providing Primary Line telephony services over a DOCSIS 1.1 infrastructure**
- **Compliance Testing for PacketCable 1.0 started in early 2001**



# Why IPCablecomm?

Cisco.com

- **Vendor Perspective**

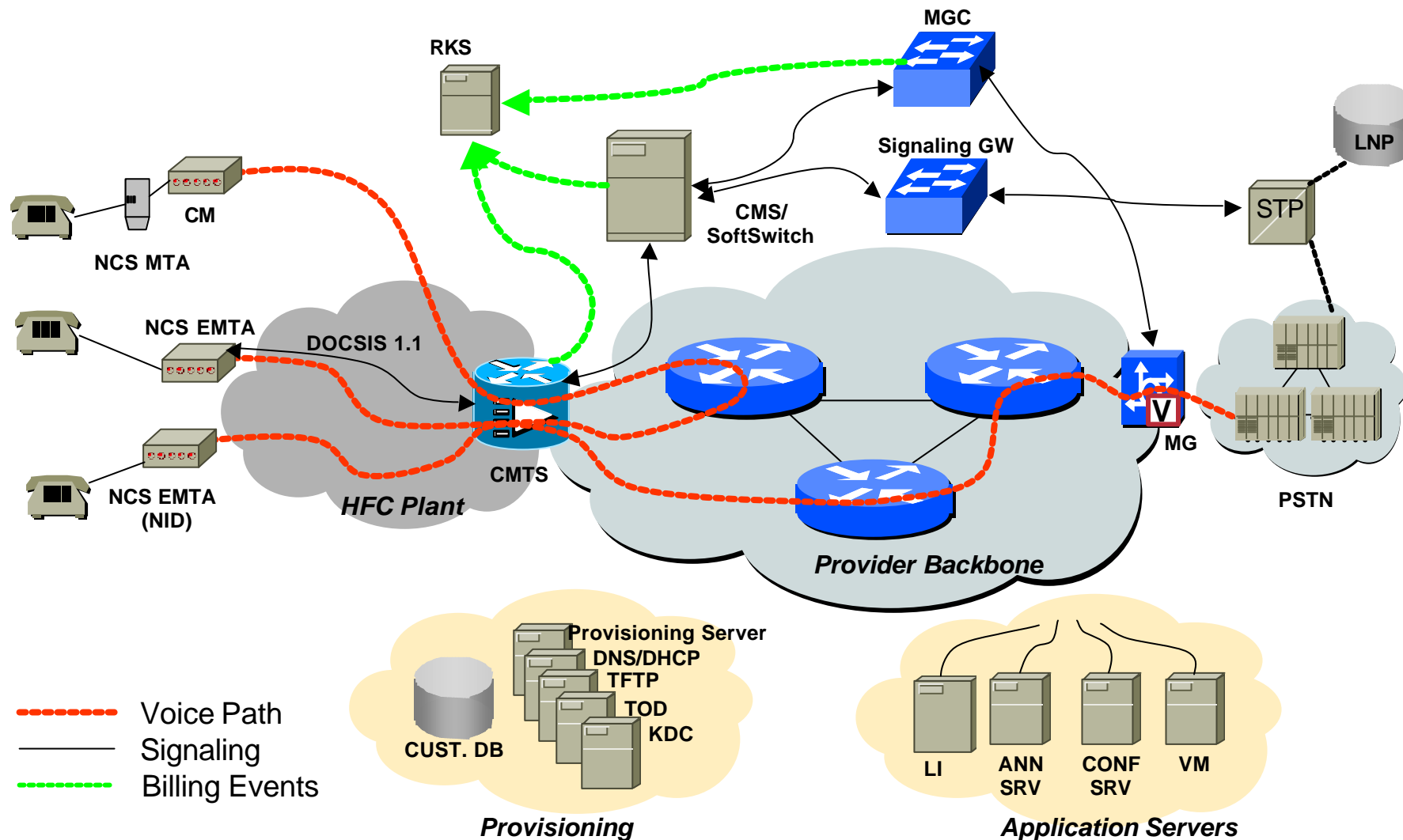
**Well defined interfaces**  
**“Independent” Testing**  
**Interoperability lab**

- **MSO Perspective**

**Pick Best of Breed Vendors**  
**Minimize integration effort**  
**Implement infrastructure to Bill for QoS**  
**Minimize fraud scenarios**

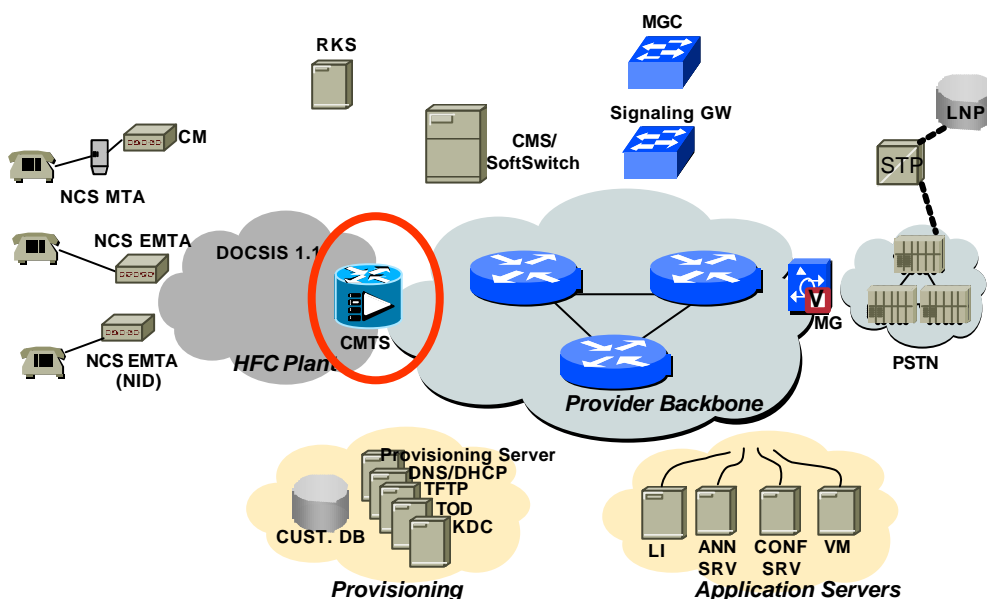
# PacketCable™/IPCableComm Architecture

Cisco.com



# Architecture—CMTS

Cisco.com



- **uBR7246VXR**

**DOCSIS 1.0+, then 1.1**

**First DOCSIS 1.1  
Qualified Routed CMTS.**

**PacketCable™ Support  
being tested TODAY.**

**Provide Voice Services  
today on a proven  
platform.**

**Only CMTS in  
PacketCable™ AITN.**

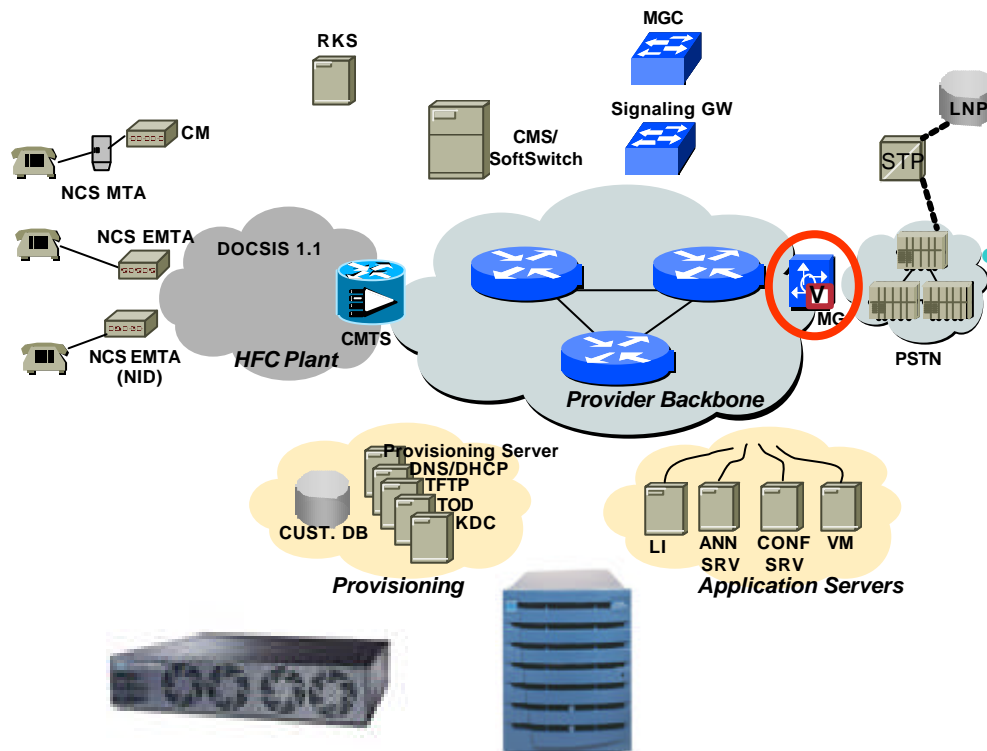


- **uBR10012**

**DOCSIS 1.1 Qualified  
Highest density CMTS  
shipping today.**

# Architecture—Media Gateway/ Trunking GW

Cisco.com



## 3660, AS5350

Well-suited for trials, small deployments

3660 is current TGW for Operator Services/E911

AS5300 (Precursor to 5350) First GW used for off-netcall at CableLabs

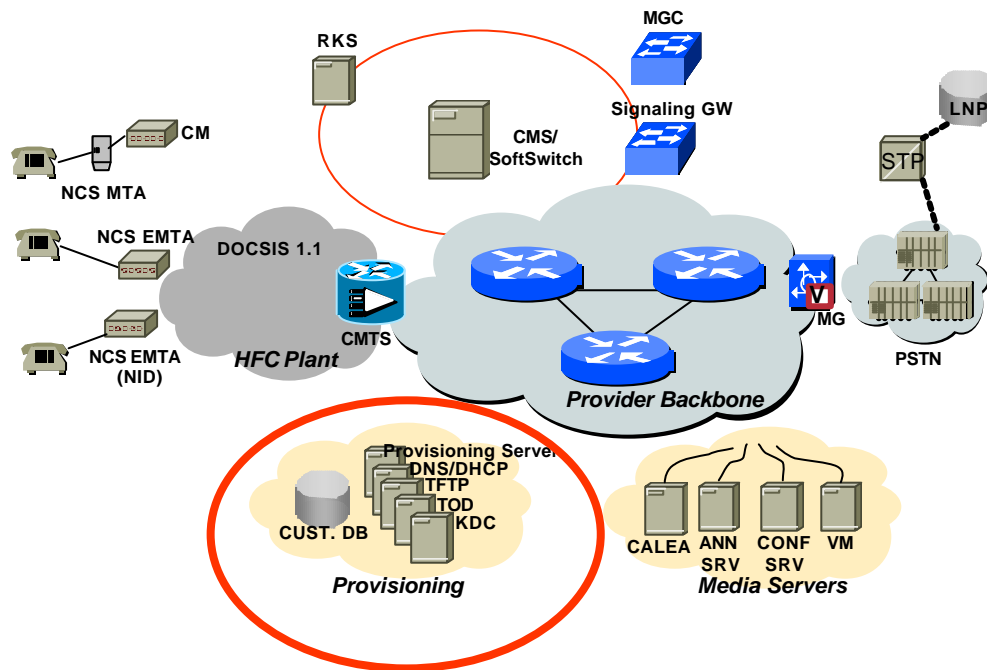
5350 Part of AITN

- **AS5400, 8260/VISM Card**  
Attractive density  
Mid-size deployments, smaller LATA subs  
Card migration from 8260 to 8850

- **8850/VISM Card**  
8850-VSM Card 4000 ports G.711 3400 ports G.726/G.729A or G729B

# Architecture—Provisioning

Cisco.com



- **Cisco CSRC BPR**

**DOCSIS(DHCP,  
DDNS,TFTP)**

**PacketCable EMTA  
provisioning**

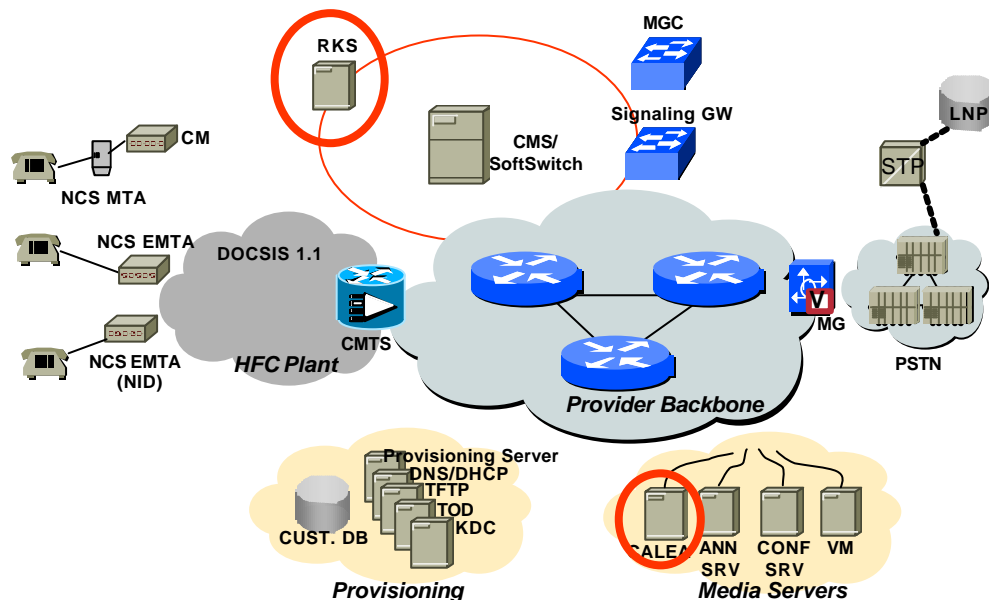
**PacketCable CMS  
provisioning**

**CSRC team helping  
develop spec**

**Part of the AITN!**

# Architecture—RKS, CALEA Servers

Cisco.com



BAY PACKETS



- **CALEA Server Partners**

**SS8, Comverse**

- **RKS Partners**

**Bay Packets**  
**Successfully tested**  
**with CMTS and**  
**multiple CMS**



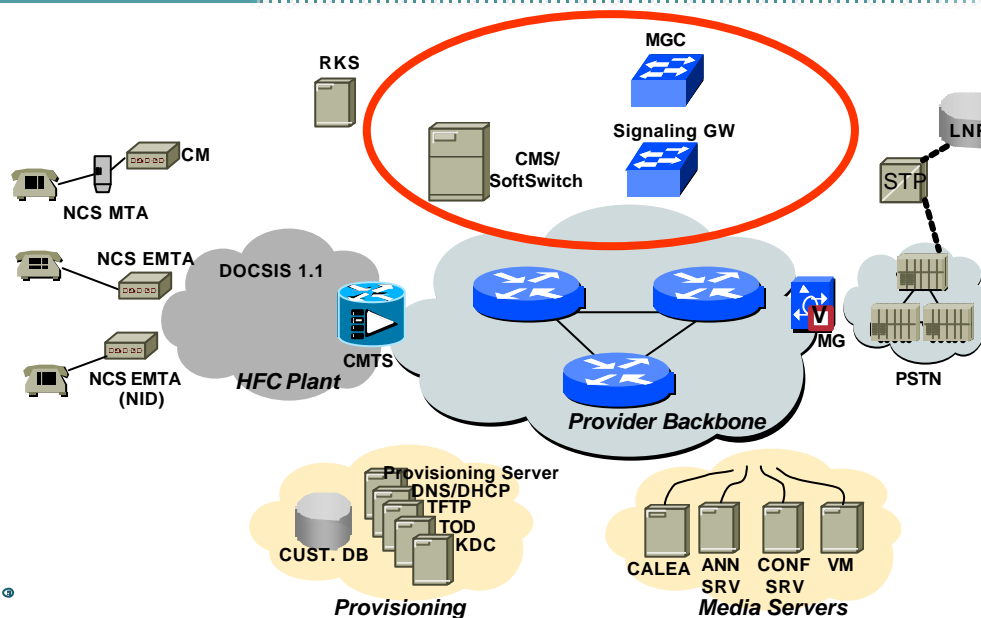
# Cable BU CMS Partner Strategy

Cisco.com

- **Identify and work with 2-3 partners including the Cisco BTS 10200**
- **Drive interop in Chelmsford lab**
- **Leverage Chelmsford interop success into “formal” PacketCable tests; creating de facto spec interpretations**
- **Minimize exposure in first trials by working with small MSOs**

# Architecture—CMS/MGC

Cisco.com



- **CMS/MGC partners**

Cisco BTS 10200 will be used in this space.

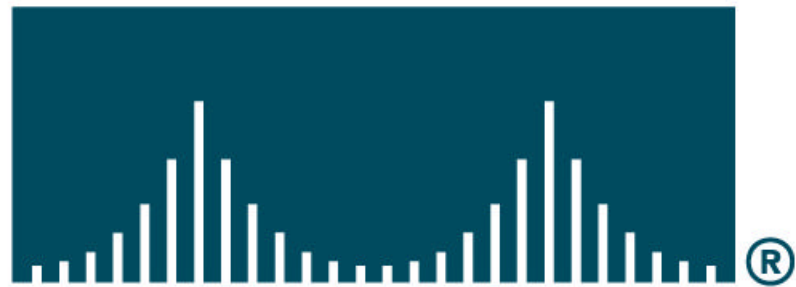
For international opportunities we look to leverage the PGW2200 as an MGC.



# Conclusions

- **Cable VoIP is real.**
- **Cable VoIP is no longer “Bleeding” edge. Now it’s just leading edge.**
- **One size does no fit all.**
- **Different customers require different solutions.**
- **Cisco has the experience, knowledge and products to get you to a revenue producing service today.**

# CISCO SYSTEMS



EMPOWERING THE  
INTERNET GENERATION<sup>SM</sup>