

# VoIP BoF SANOG8

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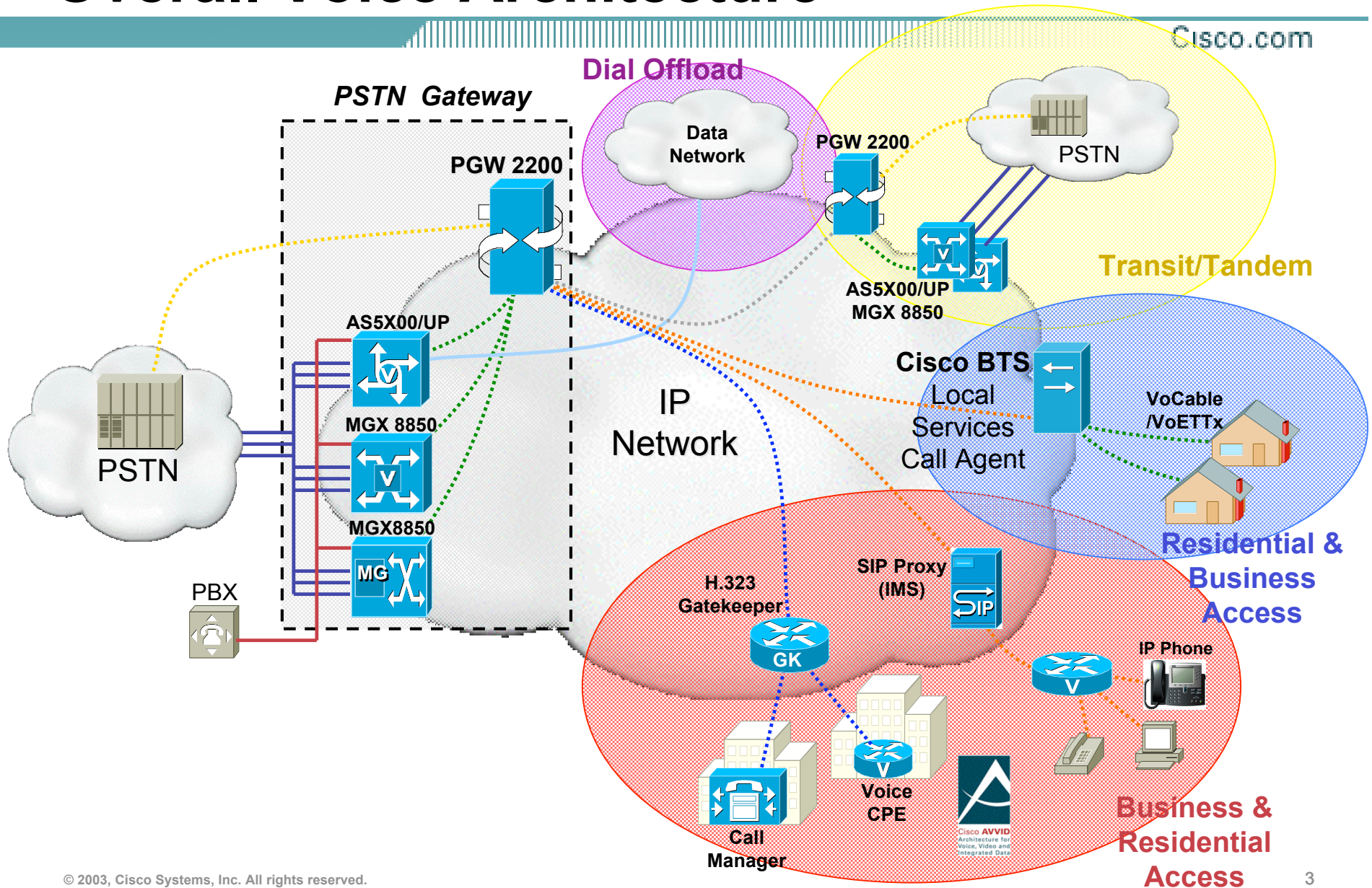
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# BoF Agenda

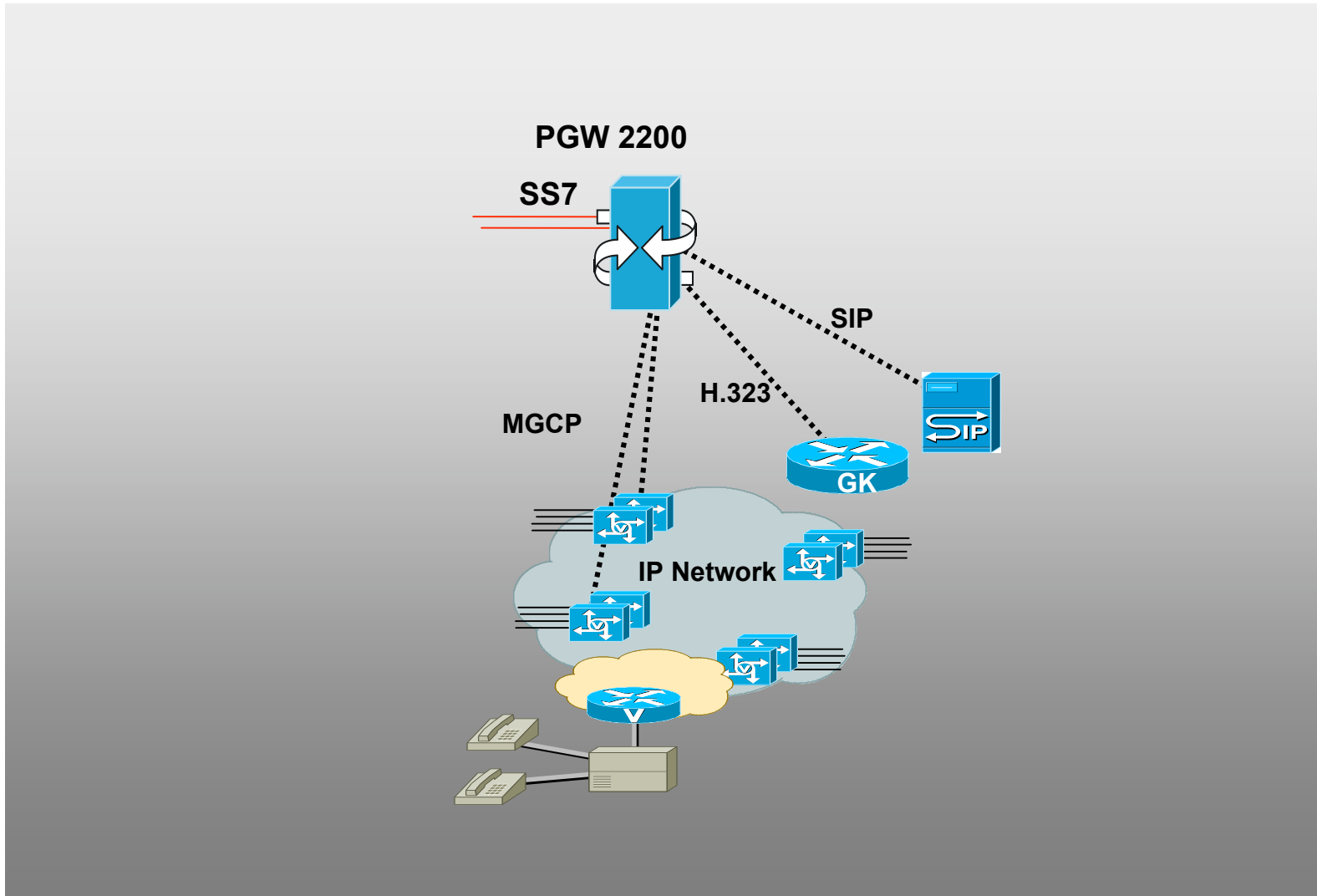
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- **Introduction**
- **History Voice (H.323, MGCP, SIP, Softswitches IMS ... )**
- **SP Architectures**

# Overall Voice Architecture

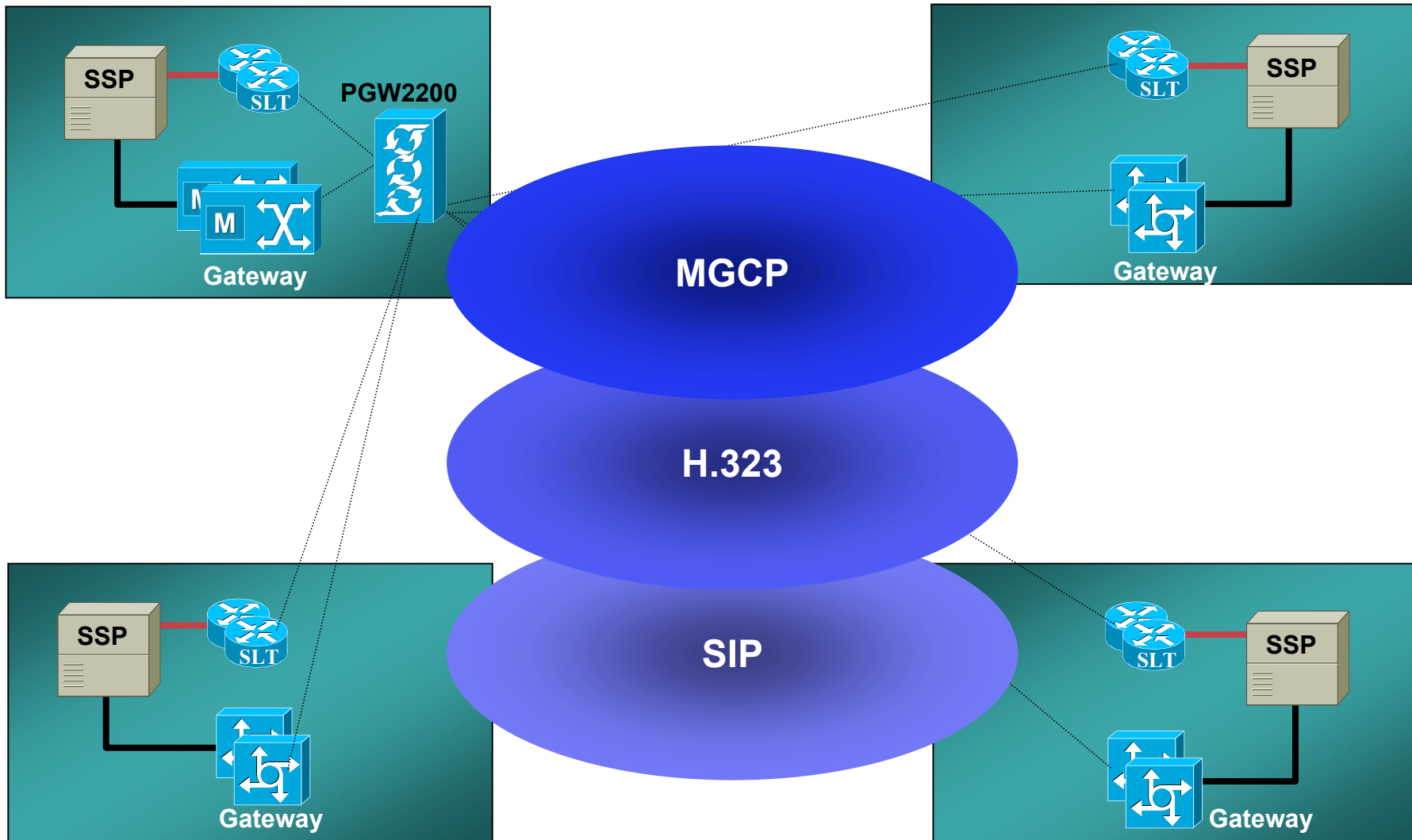


# LDI High Level Architecture





# PGW2200 Protocols



# Customer Snapshot

## China Unicom – World Largest VoIP Network



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- **Services**

- **Calling Card**

- **Post-paid**

- **Pre-paid re-chargeable**

- **Pre-paid non re-chargeable**

- **Single stage dialing:**

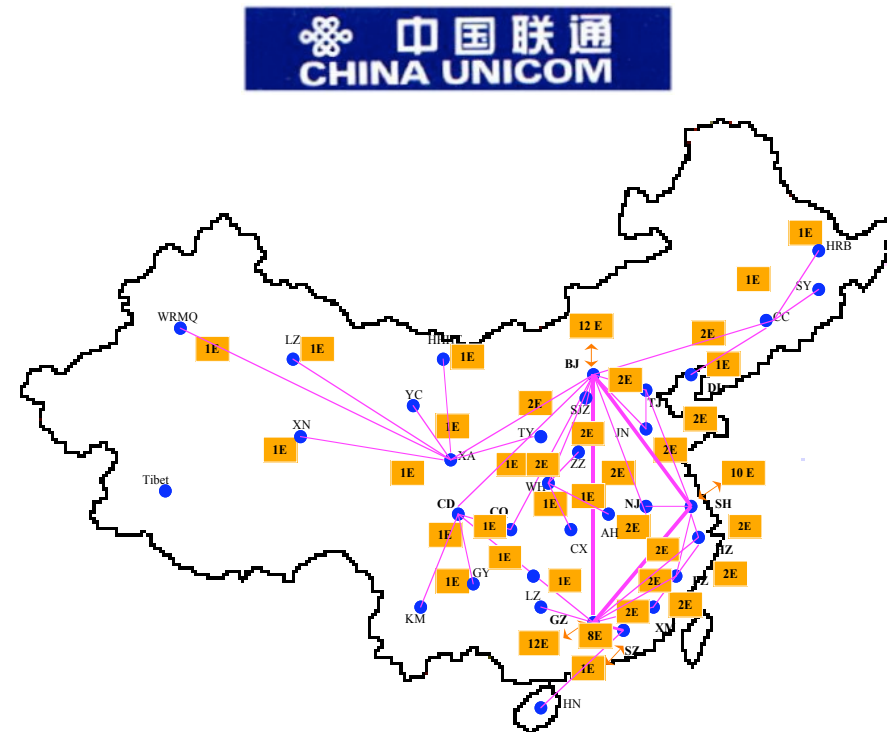
- **National & International Transit**

- **Scalability**

- **Directory gatekeeper technology**

- **Extensibility**

- **Foundation for move into residential broadband telephony**



**350 Cities**  
**20,000 E1 Capacity**  
**700M Minutes per Month**

# Telecom Italia: FINANCIAL TIMES Wednesday

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## Rolling out the future

In Italy much of the voice traffic has joined data through the same network. Ben Hunt reports on Telecom Italia's venture

Telecom Italia will today say it has won a march over its rivals, with the implementation of Europe's first significant voice-over internet protocol service, VoIP, which allows voice traffic to travel through the same network as data, so that service providers need maintain and service only one network, as widely seen as the future of telephony but its adoption has so far been limited.

For some months Telecom Italia has run half its international voice traffic over VoIP and more recently switched all domestic traffic travelling between Rome and Milan on to its IP backbone. These adds up to about 350 minutes of calls per year from a voice total of 240.

At a time when all telecommunications service providers are seeking ways to cut expenditures and find new sources of revenue, IT says that its move to VoIP eases the former in the short term and will eventually allow it to add new services for customers as it rolls over the network.

Stefano Pileri, head of Telecom Italia's domestic network, says the conditions for the roll-out of VoIP are now right. Months of laboratory testing have satisfied the group that the quality of service is sufficient to carry such a vital part of the group's traffic.

Moreover, Mr Pileri says Telecom Italia's return on investment will be quick and will grow rapidly. "The operating costs needed to manage the long-distance voice network will decline by 20 per cent in the next year and then 50 per cent in 2004. This is a good economic result," he said.

According to IDC, the Boston-based research group, spending on VoIP in western Europe was just \$150m (down 15.2%) but is set for exponential growth and is forecast to reach \$2.4bn by 2006.

At present voice traffic in Europe accounts for 80 per

cent of all spending on fixed-line telephony, despite the fact that the growth in data traffic means that voice calls represent a fraction of the total traffic. Analysts, the UK research group, says that most large operators now view the integration of their voice and data traffic on to a single network as the best method of achieving economies of scale.

Mark de Simone, Cisco Systems vice-president for technology solutions in Europe, the Middle East and Africa, says the key to cost-savings is to simplify the network. Cisco developed Telecom Italia's VoIP service in partnership with systems integrator Italtel.

Telecom Italia's traditional circuit-switch-based network was built on 64 national transit switches, while the IP network uses just 14 exchanges. "And in an old network every node needs to be connected to every other node with a specific link, so they need to make 64 connections from each. In an IP-based network its just one connection per node, so the number of connections comes down from about 2,000 to 24," Mr de Simone says.

Telecom Italia has a four-stage strategy for the roll-out of VoIP, beginning with its national transit network such as the link between Rome and Milan, which the group expects to have completed by the first quarter of 2004. The next step is the roll-out of service into its corporate network, which Mr Pileri says will allow its customers to share cost savings by combining broadband data and voice networks. This will cut both access and maintenance charges.

When corporate VoIP

access is in place, Telecom Italia plans to add services exploiting the convergence of voice and data, such as video conferencing and unified messaging options. Its long-term aim is to have all voice traffic travelling over VoIP but Mr Pileri says that may be some way off. "We don't have a plan at the moment for the local voice network but it will take at least six years."

In the past VoIP has endured a reputation for crackly, disjointed calls but Telecom Italia's service has overcome the problem with a multi-label protocol switching technology, which enables bits of information to be prioritised over the network. "This tags the bit as a voice bit and treats it [in a different way], so we can have carrier-class voice calling, as the voice traffic is prioritised for delivery. It doesn't matter if an email arrives two seconds later but with a voice call that can't be allowed," Mr de Simone says.

It is not surprising that Cisco, as a leading equipment supplier, is enthusiastic about the potential for VoIP. But Mr de Simone says the group is already realising what it promises and the additional services it expects service providers to add have revolutionised the Internet communications. "Cisco runs voice-over on our IP network and the capacity is limited by video. So when the president wants to comment on the latest quarterly results we link up from our workstations and ask questions with voice or on video. We can do things we have never been able to do before," he says.

He believes that the extensive roll-out of services in a country of 50m people proves that the service works and that Telecom Italia's example will be followed. "Telecom Italia is the one that has taken the greatest steps but everyone out there is now looking at beginning similar projects."

## Telecom Italia takes Europe's biggest step in Voice over IP with Cisco Systems and Italtel

(.....)

**100% of Telecom Italia's national Rome-Milan voice calls and 50% of its international European voice calls now run over a converged "VoIP/MPLS" network**

***"We chose VoIP because we could save two thirds of our transit operating expenses and give our customers and shareholders a better service. By the end of 2003, we estimate that 80% of Telecom Italia's transit voice traffic will travel over the Cisco Systems and Italtel Multiservice solution. We chose Cisco Systems and Italtel because they had the most reliable solution. Cisco Systems has more experience in IP technology and VoIP than any other infrastructure company and the partnership with Italtel provides additional expertise in the switching carrier environment"***

said Stefano Pileri,  
head of Telecom Italia's domestic network



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# **Additional Services Business & Residential**

# Managed & Hosted IP Telephony

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- **What is M-IPT & H-IPT**

**Ability to provide “fully managed” Telephony service, and much more, tailored to Business customers by Service Providers**

- **Highly flexible Architecture**

**Call Control: On-premises or Centralized Hosted**

**PSTN Interconnection: Centralized or On-premises**

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# Managed & Hosted IP Telephony

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- What are the requirements for for such a service?

**Line Side Call Control**

Interface to **Legacy equipment** (such as PBX, Voicemail)

Dial plan Management

Interface to the **PSTN/PLMN**

**Billing**

Customer Premises Equipment e.g. **Analog or IP Phones**

- **IP Network**

# Managed & Hosted IP Telephony

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- **What else do you need to cater for?**

**Quality of Service (SLAs)** – not just component level, must be end-to-end!

**Resiliency** (*Voice products: Remote Site Telephony; IP Network: Dial backup*)

**Security** (Enterprise & your network!)

**IP Addressing**

# Managed & Hosted IP Telephony

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- Ability to add **enhanced (Value Add) services**

**Data Services on IP Phones,**

**International VoIP,**

**VoIP over VPNs (VoVPN),**

**IP Contact Centers,**

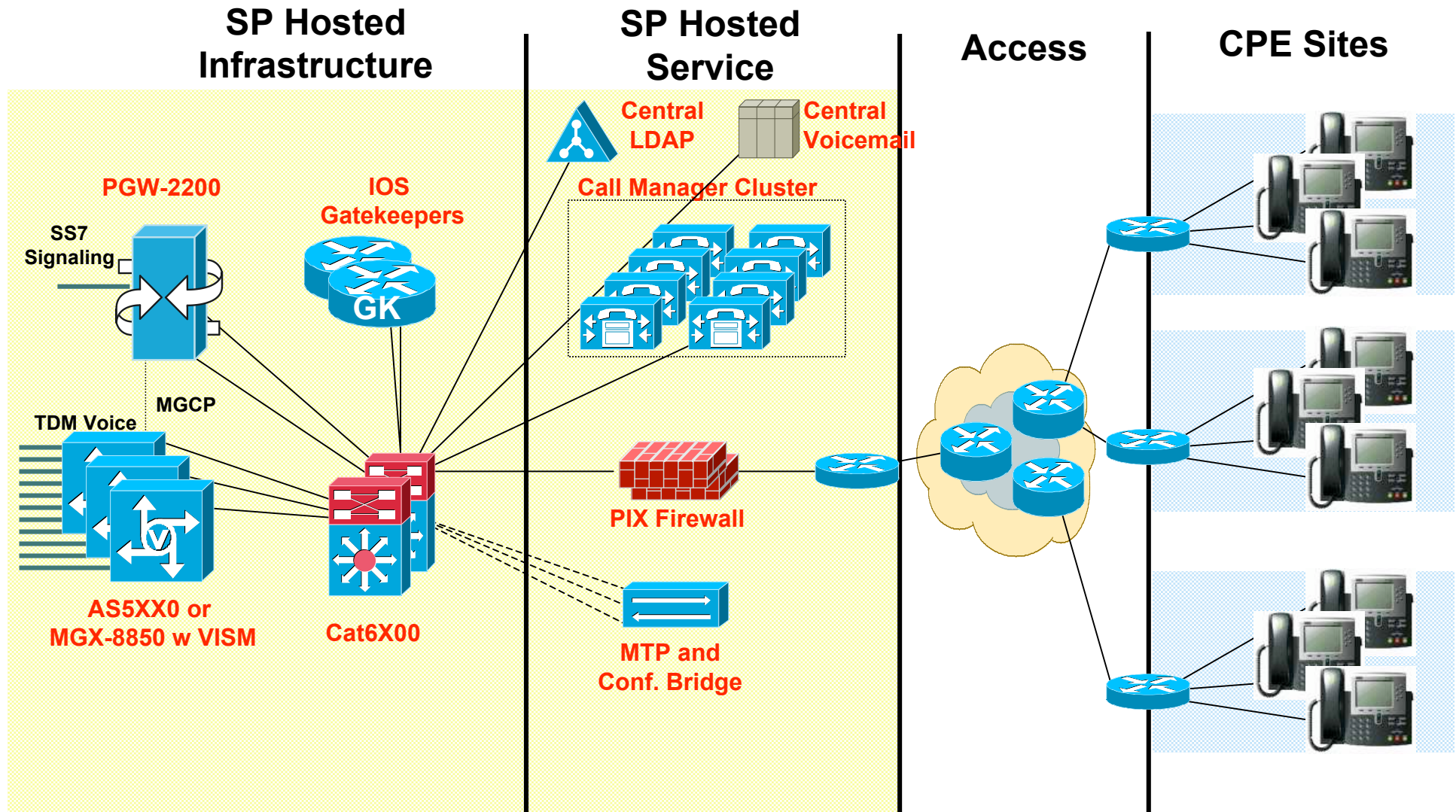
**Unified Messaging,**

**Video,**

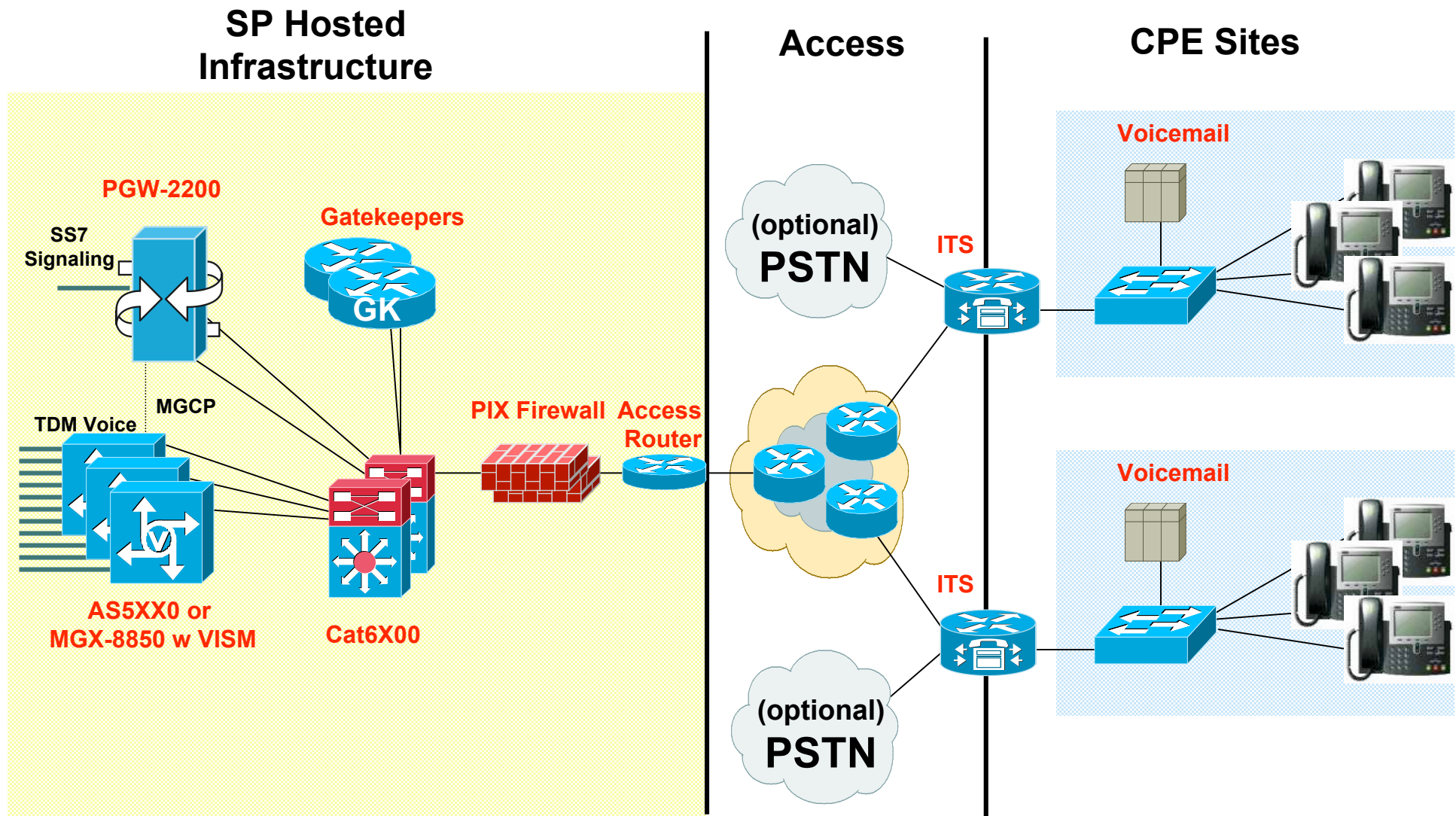
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# Managed Hosted IP Telephony configuration



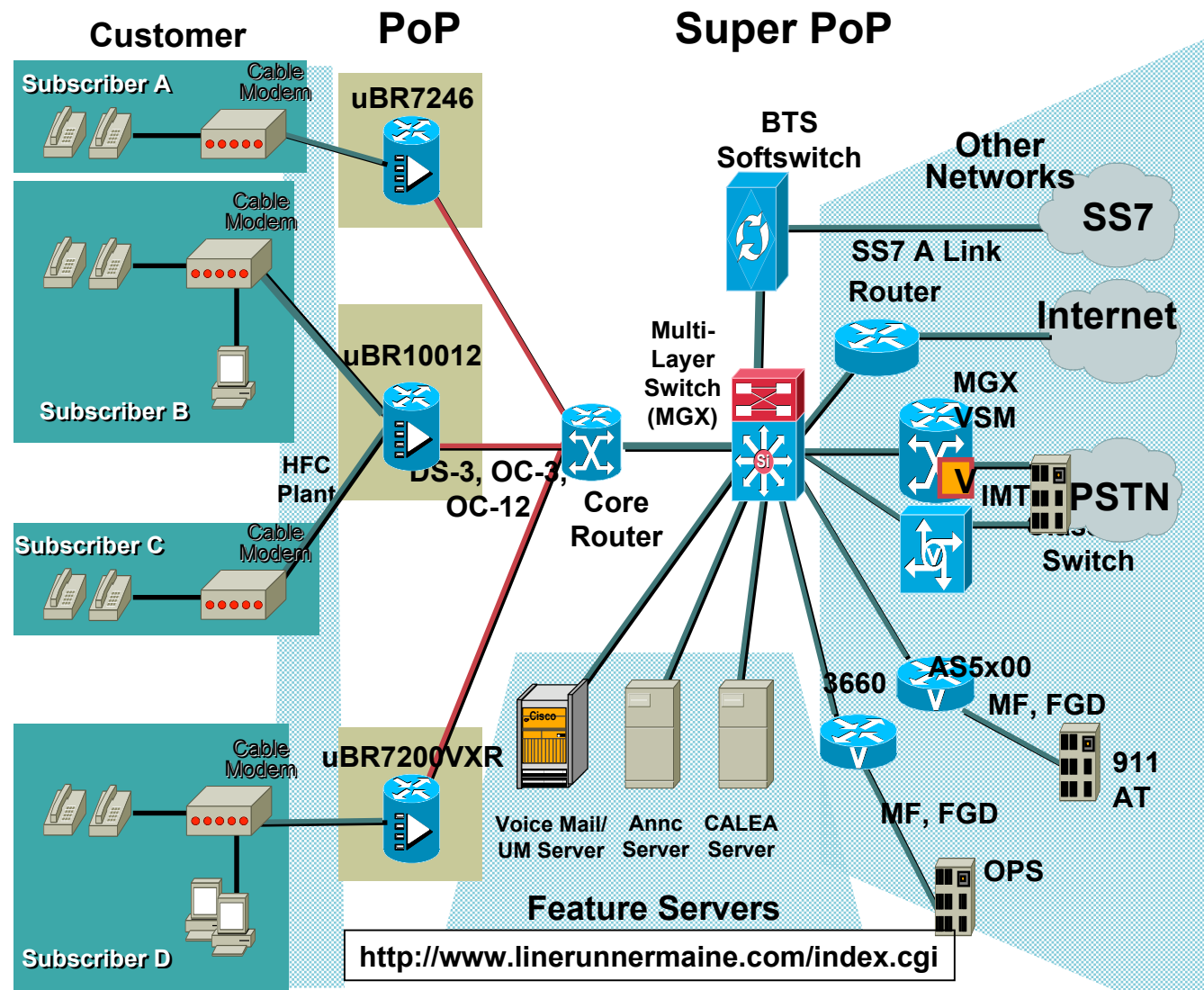
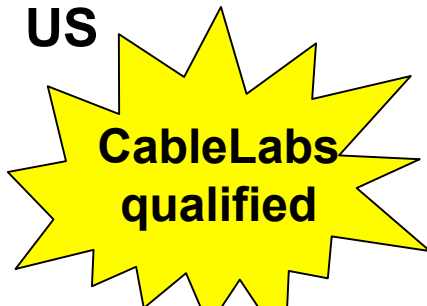
# Managed IP Telephony with ITS configuration

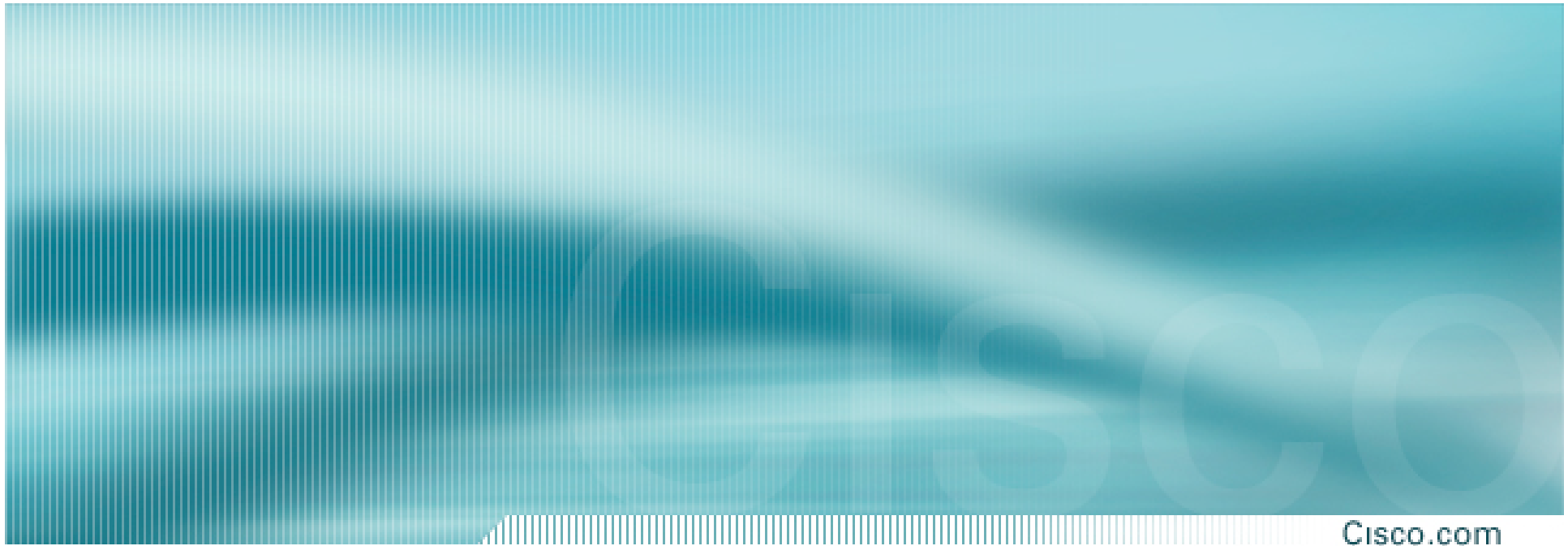


# Cable Telephony Solution – Time Warner Cable

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- TWC went in service in March 2003
- Supplementary Services (CFx, CW etc) for Analog subscribers
- Service is \$39.95 per month and includes unlimited calls in US





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# IMS

# Evolution, not Revolution

- **Various customers have different network strategies**
- **Tomorrow's network is IMS**
- **Graceful evolution from existing networks (e.g. PacketCable) to IMS is essential**
  - **Leverage existing investment to reduce equipment costs**
  - **Subscriber experience**
  - **Leverage existing expertise to reduce operating costs**
- **SP Architectures**

# Converged Multimedia IP Communications Services

