Introduction to NGN solutions

Enrico Basso

basso@marconi.ttc.cz

Company Overview

u **Developer of voice switching equipment for operators**

- Class-4 Transit & Class-5 Local Exchange Switch
- With native support for TDM, ATM and IP
- Designed with Next Generation technologies
- Interoperable with mobile networks

u **Products operational on the field since 1998**

- Over 300 Cirpack systems deployed in real telco infrastructures
- Over 22,000 E1 interfaces shipped (TDM, ATM, IP technologies combined)
- Several billion minutes carried per month, real traffic

u **Private Company, Owned by its management**

- Headquartered in Suresnes, near Paris, France
- Started in 1997, first system deployed in 1998
- Profitable since 2001, No debt

CIRPACK

Cirpack Targets

u **Target Customers**

- Incumbent & Alternative operators
- Long distance carriers & Wholesalers
- ISP and ASP

u **Target Applications**

- TDM/IP/ATM trunking & SS7 interconnect (Class-4 replacement)
- POTS and ISDN telephony (Class-5 replacement)
- VoDSL, VoIP, VoWLL, VoCable… (Packet telephony, Double/Triple play)
- IP Centrex (Hosted PBX) and value-added voice services

u **Target Geographies**

- Western & Eastern Europe
- Middle East & Northern Africa
- Southern Asia & Latin America

CIRPACK

Global Network of System Integrators

IBM	EMEA, Asia and Latin-America
INTRACOM	South & Eastern Europe and Middle East
TELINDUS	Benelux and Western Europe
TTC MARCONI	Central and Eastern Europe

And other local system integrators…

CIRPACK

Customer References

Iceland
og vodafone

Ireland
Smart telecom

Benelux
#easynet
net▶▶
mobistar

Denmark
cybercity

France
free TELECOM
tiscali.
T··Online·
altevia
B3G Telecom
n9uf telecom
Atos Worldline
Prosodie
outremer telecom
altitude telecom

CIRPACK

Germany
Wll
SDT Sontheimer Datentechnik

Czech Republic
czech on line
voice data

Italy
B&B tel
SATCOM

Slide 5
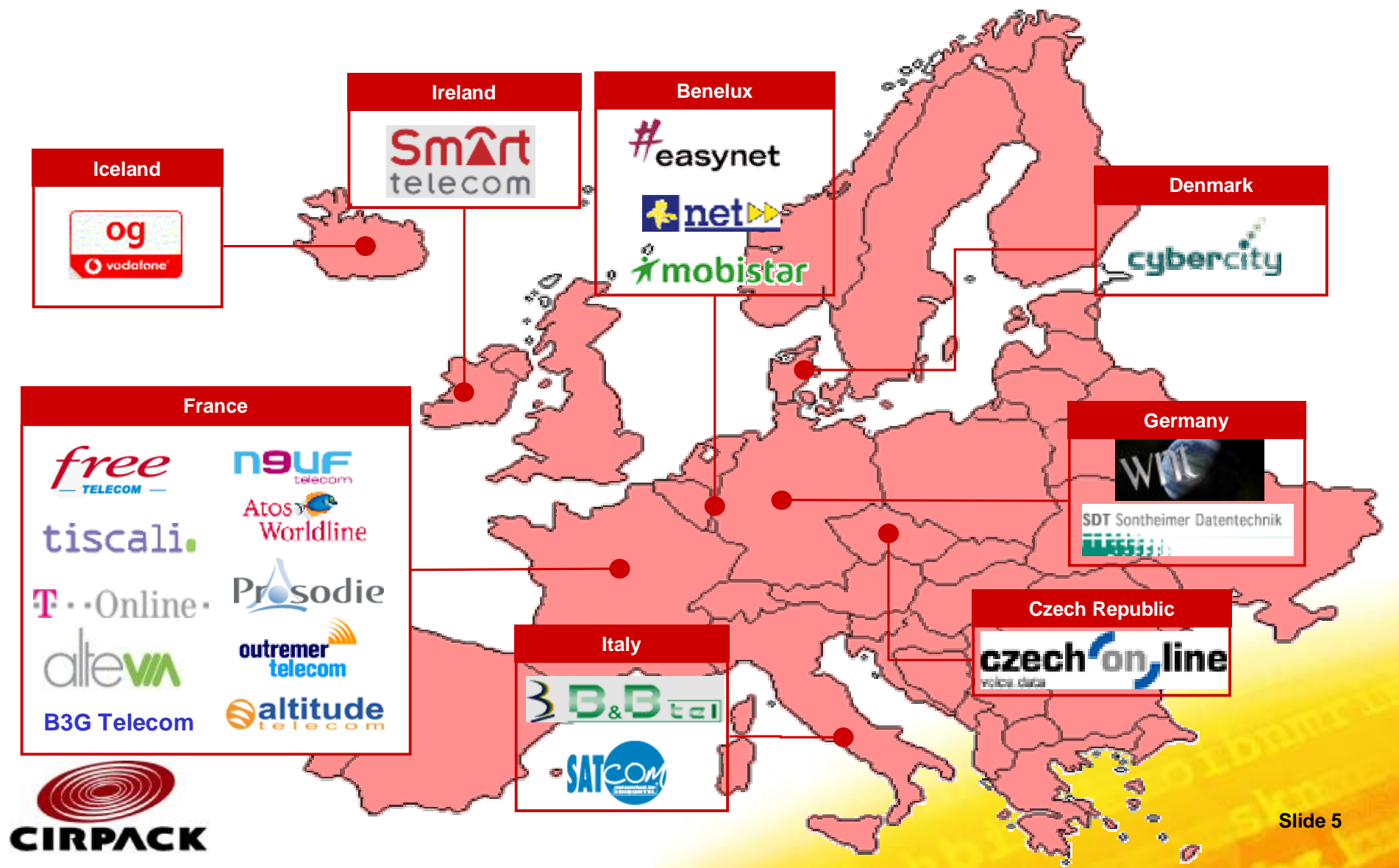
An overview
on the softswitch market

Looking at the French VoIP Market

u **Free Telecom pioneered the market**
- Launched Triple Play service in August 2003
- Largest alternative DSL provider with 900,000 subscribers
- 6 Mbps DSL + 100 TV channels + unlimited phone calls (@ 30 EUR per month)

u **9 Telecom (fka LDCOM)**
- Opened service in January 2004. Started advertising in September
- 2 Mbps DSL + unlimited phone calls

u **Tiscali**
- Launched service in June 2004
- 2 Mbps DSL + unlimited phone calls

u **Wanadoo**
- Launched service in September 2004
- 2 Mbps DSL + unlimited phone calls

u **T-Online, Cegetel and AOL are said to be preparing service launch…**

u **Largest independent ISP in France**
  - Is deploying DSLAM all over France
  - Signs over 150,000 new DSL subscribers per quarter
  - Highly profitable, Public company (Euronext ILD)

u **Residential VoIP service in mass production since mid-2003**
  - Delivers a large set of voice features (self provisioning, CLI, voice mail, etc)
  - Is now enabling full unbundling and Number Portability

u **TVoverDSL available since end-2003**
  - High definition digital TV available to all unbundled subscribers
  - Over 100 TV channels including premium programs

u **Deployment Facts:**
  - The largest VoIP deployment in Europe
  - Targets POTS replacement, not second line service
  - Carrier-class reliability and toll quality voice
  - Architecture entirely based on Cirpack Class-5 SoftSwitch & PSTN gateways
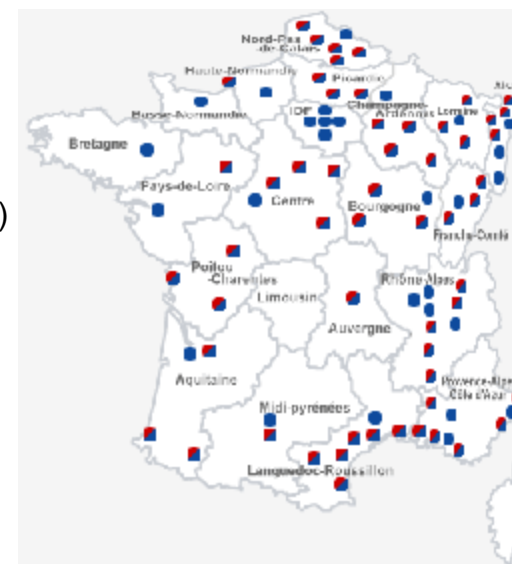
CIRPACK

Free Telecom's Network in 2001

France Telecom ←---------→ | **Free Telecom** ←---------→

Class 4 Transit

Class 4 Transit

Class 4 Transit

Class 5 Local Exchange

Class 5 Local Exchange

Class 5 Local Exchange

E1- SS7

E1- SS7

Cirpack SoftSwitch

Cirpack Gateway

SDH

Cirpack Gateway

Cirpack SoftSwitch

SS7 to other Telcos

SS7 to other Telcos

E1 -ISDN

E1 -ISDN

RAS

RAS

Internet

IP

IP
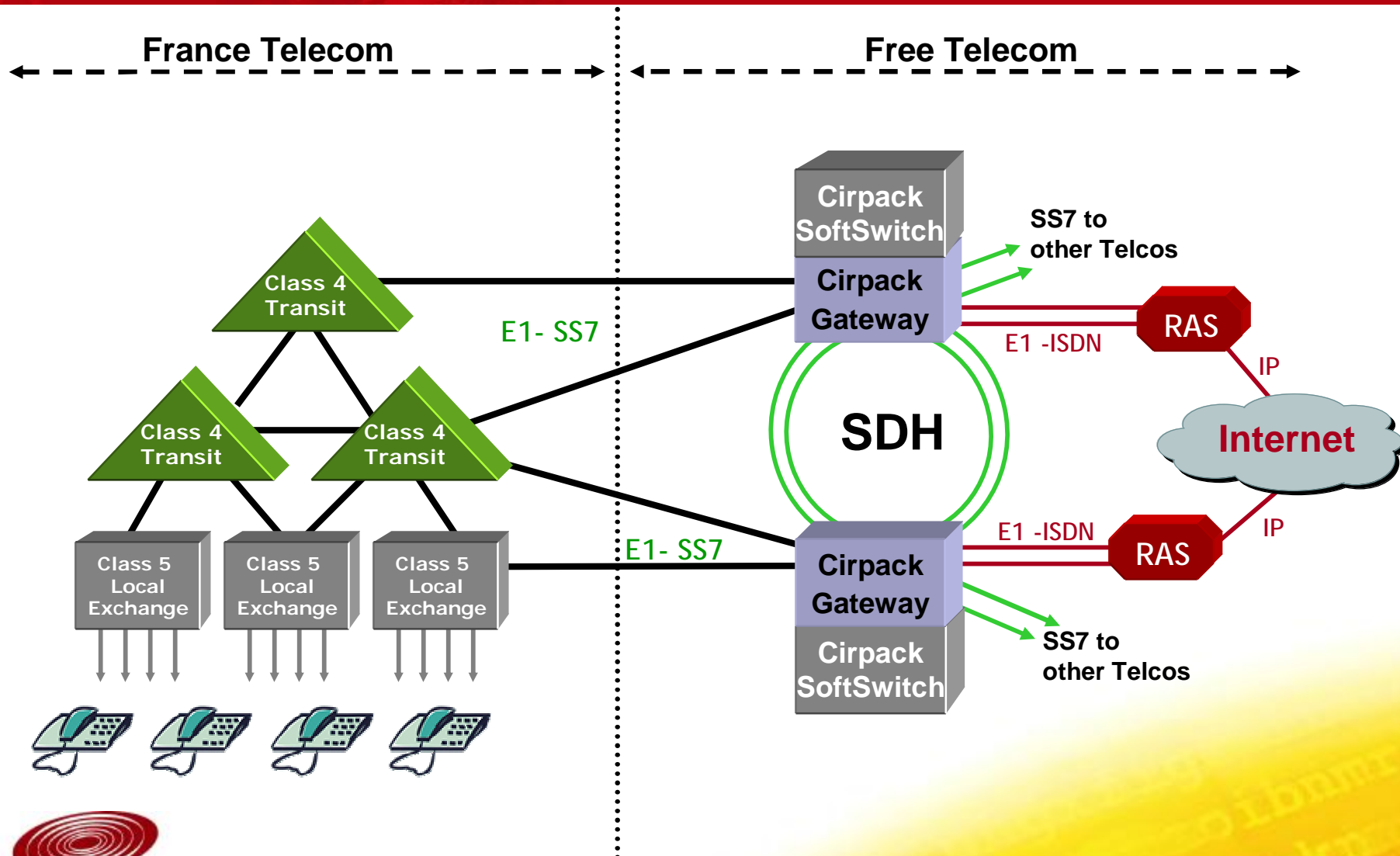
Architecture replicated in 18 regions for nationwide coverage

Free Telecom's Network in 2003

free
La Liberté n'a pas de Prix

France Telecom ← → **Free Telecom**

Class 4 Transit

Class 4 Transit

Class 4 Transit

E1- SS7

Cirpack SoftSwitch
Cirpack Gateway

Cirpack SoftSwitch
Cirpack Gateway

SS7 to other Telcos

E1 -ISDN

RAS

IP

IP Backbone
SIP Transit

Internet

Class 5 Local Exchange

Class 5 Local Exchange

Class 5 Local Exchange

E1- SS7

Cirpack Gateway
Cirpack SoftSwitch

IP/MGCP Local Loop

SS7 to other Telcos

IP

DSLAM

CPE

CPE

DSL

CIRPACK

Architecture replicated in 18 regions for nationwide coverage

Slide 11

Impact of VoIP on the French Market

VoIP as Primary Line is happening today
- Full unbundling with Number Portability to replace POTS primary line service
- ISPs will have over 1 million VoIP subscribers early 2005
- This success has dragged the entire market: the lesson is that if you want to win you'd rather shoot first, but only if the service is aggressively priced and available: need for the right equipment to support the strategy

VoIP technologies are mature for large scale deployments
- Each Cirpack SoftSwitch handles 264,000 subscribers very smoothly (twice bigger than the largest FT switch)
- ISPs deliver more Class-5 features than traditional POTS
- Large scale VoIP deployments use MGCP or SIP, not H.323

Broadband must provide Double or Triple play services
- Data only is not sustainable: it must be packaged with voice or TV
- Voice is an incredible marketing incentive, for a marginal cost
- All DSL subscribers will get managed-VoIP as a standard service by mid-2005

The Killer Application = Price
- Unlimited national PSTN termination… at no extra cost
- Full unbundling and Number Portability… at no extra cost
- Free practically is 2x more expensive than broadband, but people think it's cheaper because it comes packaged

CIRPACK

VoIP is a Disruptive Business Proposition

u **Home users pay less for their telephony than business users**

- Residential users enjoys lower prices while have less traffic
- SOHO are migrating to residential services
- SMB are looking for an alternative
- Telcos must re-think their business models

è **IP Centrex is a perfect solution for targeting SMBs**

u **Incumbent and traditional operators must migrate their infrastructures**

- Legacy TDM switches are too expensive for a competitive service
- VoIP and Next Generation Networks dramatically lower the cost of voice infrastructures
- Cirpack Softswitches can manage hundreds of thousands of users at a very low cost
- Cirpack platforms can also provide narrowband POTS/ISDN services

è **Is there still a business model for ITSPs that don't connect subscribers?**

CIRPACK

Delivering Advanced VoIP Services to All

IP Centrex add-on

Cirpack Class-5 SoftSwitch

SIP
INAP

Feature Server

IP Centrex

IP Phones & SoftPhones

Analog Phones & Faxes

POTS Gateway

MGCP/SIP

Cirpack Media/Sig Gateway

IP Infrastructure

Cirpack Media/Sig Gateway

SS7

PSTN

SIP/H.323

SIP/H.323

MGCP/SIP

NCS/SIP

H.248

IP-PBX

VoIP CPE

DSLAM

CMTS

IMAP

IP Phones

ISDN PBX

ISDN Phones

xDSL

ATA

Analog Phones

IP Phones & SoftPhones

Cable

MTA

Analog Phones

IP Phones & SoftPhones

POTS/DSL

Analog Phones

IP Phones & SoftPhones

CIRPACK

Slide 14

Easy Integration of VoIP with an Existing PSTN

- **Leverages existing voice infrastructure**
- **Same platform manages VoIP, IP Centrex and TDM services**
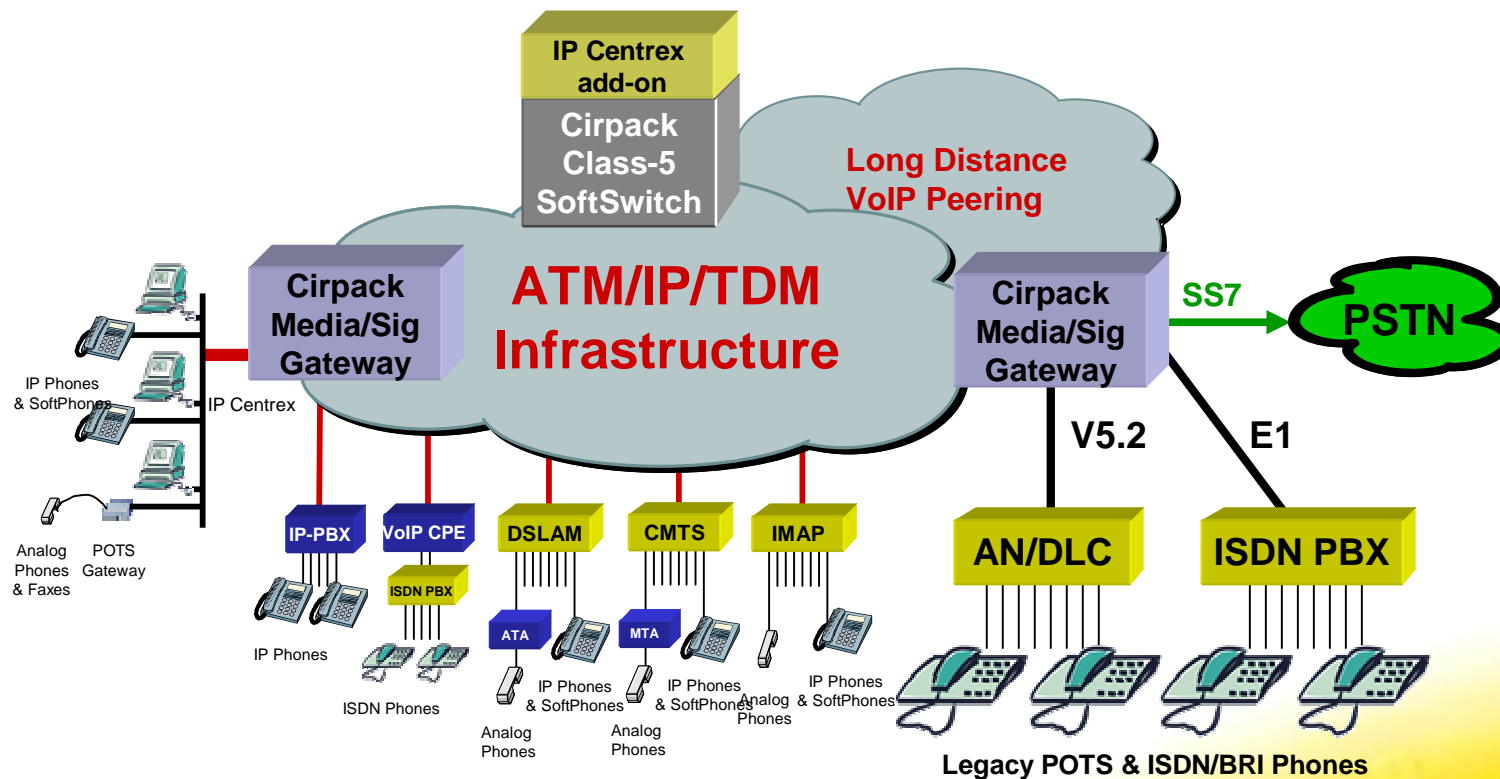
Cirpack Technologies

Cirpack TN: Low Density Universal Class-4 Switch

u **Platform = CompactPCI Shelf**

- Small footprint: 10U
- Redundant and hot-swappable CPU, hard disks, interface boards, power supplies, etc.
- 99.9998% availability (field proven)
- Carrier-Class Features

u **Cirpack Transit Node**

- Manages up to 200 E1s (mixed ATM, IP, TDM traffic)
- Delivers Class-4 services enabling complex transit solutions
- Can be upgraded to Class-5 services via simple software download
- Supports SIP, H323, ATM BLES, R2, ISDN, SS7, INAP… all simultaneously
- Fits in any collocation room with full fiber networks and mixed ATM, IP, TDM

u **Target Market**

- ASP, ISP and carriers deploying small POPs from 20 to 200 E1
- Operators looking at feature-rich, cost-effective and evolutive transit applications

CIRPACK

Cirpack LEN: Low Density Universal Class-5 Switch

- **Platform = CompactPCI Shelf**
  - Small footprint: 10U
  - Redundant and hot-swappable CPU, hard disks, interface boards, power supplies, etc.
  - 99.9998% availability (field proven)
  - Carrier-Class Features

- **Cirpack Local Exchange Node**
  - Manages up to 200 E1s and 20,000 subscribers (over ATM, TDM and IP)
  - Delivers Class-4 and Class-5 subscriber services over any local loop
  - Supports SIP, H323, MGCP, ATM BLES, V5.1, V5.2, R2, ISDN, SS7… all simultaneously
  - Fits in any collocation room with full fiber networks and mixed ATM, IP, TDM

- **Target Market**
 - Alternative service providers deploying access networks to connect subscribers
  - The ideal Local Exchange switch for initial Class-5 deployments, from 20 to 200 E1
  - Delivering POTS, ISDN BRI and PRI as well as VoIP, VoDSL, VoCable, VoWLL, etc.

CIRPACK

Cirpack TN and LEN: Interface Boards
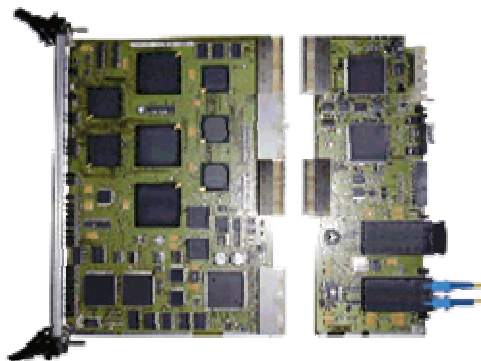
- 8 E1 Copper
- SDH with 21 / 42 / 63 E1
- ATM AAL1 / AAL2 with 2048 DS0
- VoIP with 1024 DS0
- DSP with up to 16,000 MIPS
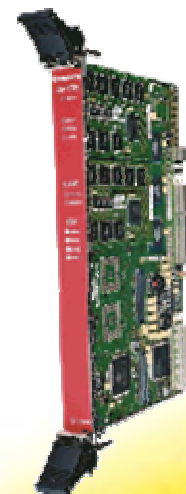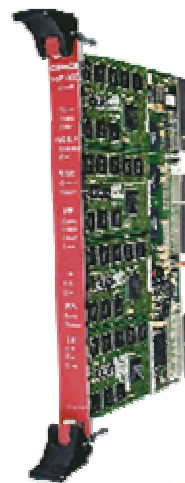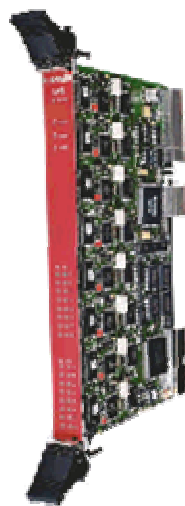
Grow the TN or LEN to a Class-4/Class-5 MultiNode

u **Cirpack MultiNode: Large Density Public Telephony Switch**
- Up to 5 million BHCA, just by adding more Intel CPU ("pay as you grow")
- Up to 6,000 E1s (180,000 DS0) just by adding more Cirpack shelves
- Up to 264,000 subscribers handled from a single platform

u **Components:**
- Call Control = Cirpack/IBM HVS SoftSwitch
- Media/Signaling Gateway = The existing TN or LEN shelf
- Up to 32 local or distributed Cirpack shelves can be part of a Cirpack **MultiNode**

IBM @server

u **Cirpack/IBM HVS SoftSwitch:**
- Multi Load Sharing Intel CPU with Linux OS
- 1+1 Redundant, High Availability drivers (99.999%)
- Manage IP, ATM and TDM services simultaneously
- Same software as Cirpack LEN and Cirpack TN
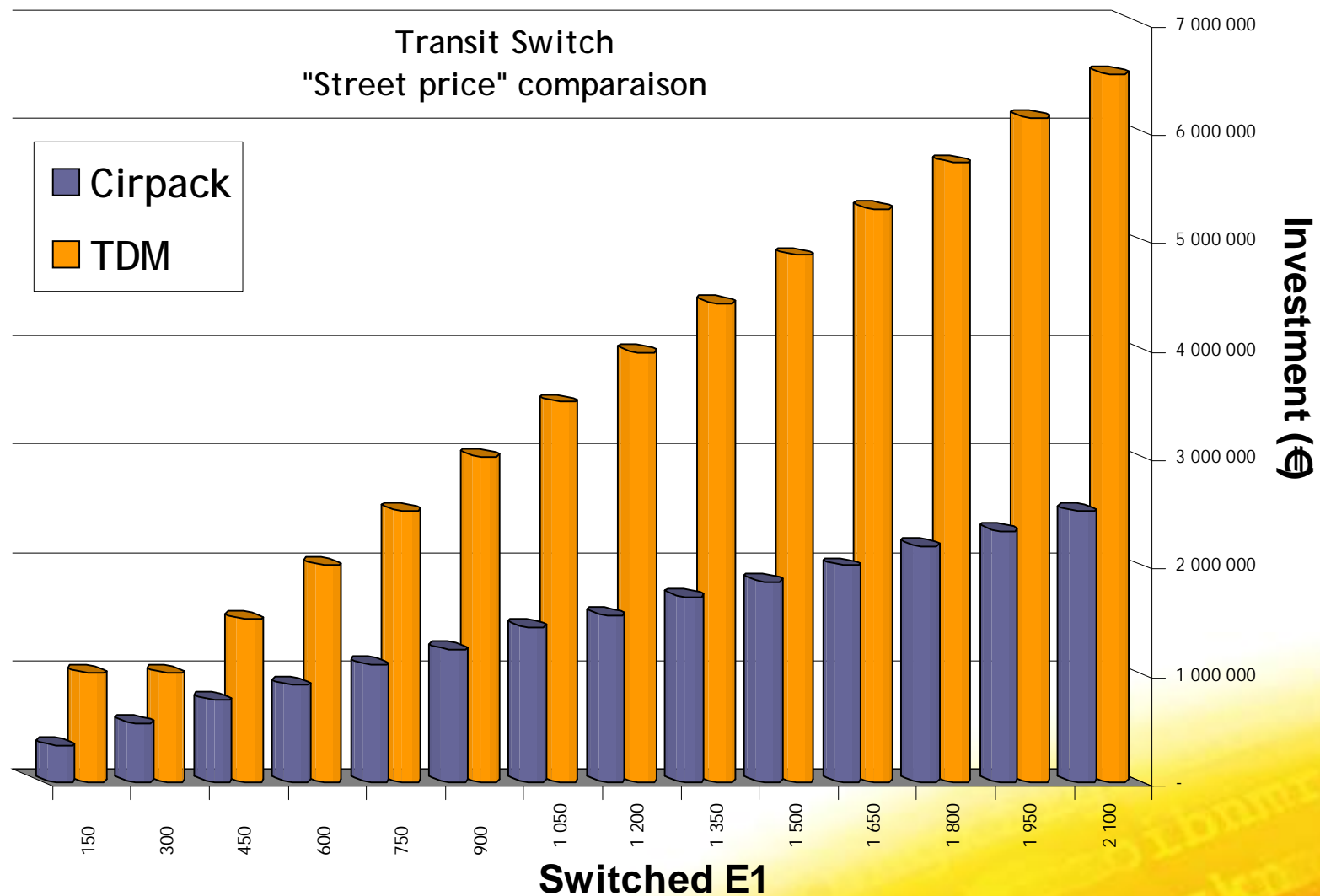- Advanced Class-4 and Class-5 services

CIRPACK

Cirpack Competitive Advantages

Cirpack Competitive Advantage

u **Strong ETSI Knowledge**
- European Customer base, European R&D

u **Strong TDM Knowledge**
- Support for 30 SS7/ISUP and 40 ISDN variants, INAP, MAP, V5.1, V5.2, R2… simultaneously

u **Wide Packet-Telephony Support**
- VoIP: SIP, SIP-T, MGCP, NCS, H323, Sigtran, H248 (end 2004)
- VoATM: AAL1, AAL2, BLES, ELCP

u **Class-5 Switches in Operation**
- POTS & ISDN over V5 as well as VoIP & VoATM generating revenues

u **Carrier Class Product, 99.9998% Availability**
- Field-proven reliability, with pick traffic and complex routing

u **Scalability Demonstrated**
- Easy upgrade of features (Class-4 to Class-5 via simple software upgrade)
- Easy addition of customized features (time to market in weeks rather than months)
- Easy addition of capacity (from 8 to several thousand E1)

u **Open to Third Party Solutions**
- Field-proven interoperability with IP Phones, IADs, Access platforms, Application servers, etc.
- Extensive ecosystem to promote best-in-class equipment and global solutions

CIRPACK

CAPEX: Cirpack versus TDM

Transit Switch
"Street price" comparaison

Investment (€)

Switched E1

Legend: Cirpack, TDM

OPEX Details (1)

	Legacy Switch	Cirpack Switch
Maintenance Fee per year	Up to 30% of acquisition cost	Marginal
Software Fee per year	50 K€, 100 K€, …?	0 K€ No hidden costs
Facilities	50 to 100 m2 + white room	One 19 inches 10U rack = 250 E1
Training	Several weeks/months abroad (e.g. Nortel in Scotland)	One week in your premises

CIRPACK

OPEX Details (2)

	Legacy Switch	Cirpack Switch
Installation Cost	A few months for several engineers and technicians	A few days for one engineer
Know-How	No transfer possible	Knowledge transfer thanks to Open Platform
VoPackets	External Voice Gateway required	Native support of IP and ATM, No need of Voice Gateway

CIRPACK

Narrowband Voice Solutions

Delivering POTS and ISDN Voice Services

- u **Legacy voice services delivered in a NGN environment**
- u **Full compliance with V5 and ISDN standards**
- u **All relevant Class-5 services are delivered to subscribers**

Cirpack SoftSwitch

ATM IP TDM

Cirpack Gateway

Cirpack Gateway

SS7

PSTN

E1

V5.2

V5.2

E1

ISDN PBX

AN/DLC

AN/DLC

ISDN PBX

Last Mile Copper

Legacy POTS & ISDN/BRI Phones

CIRPACK
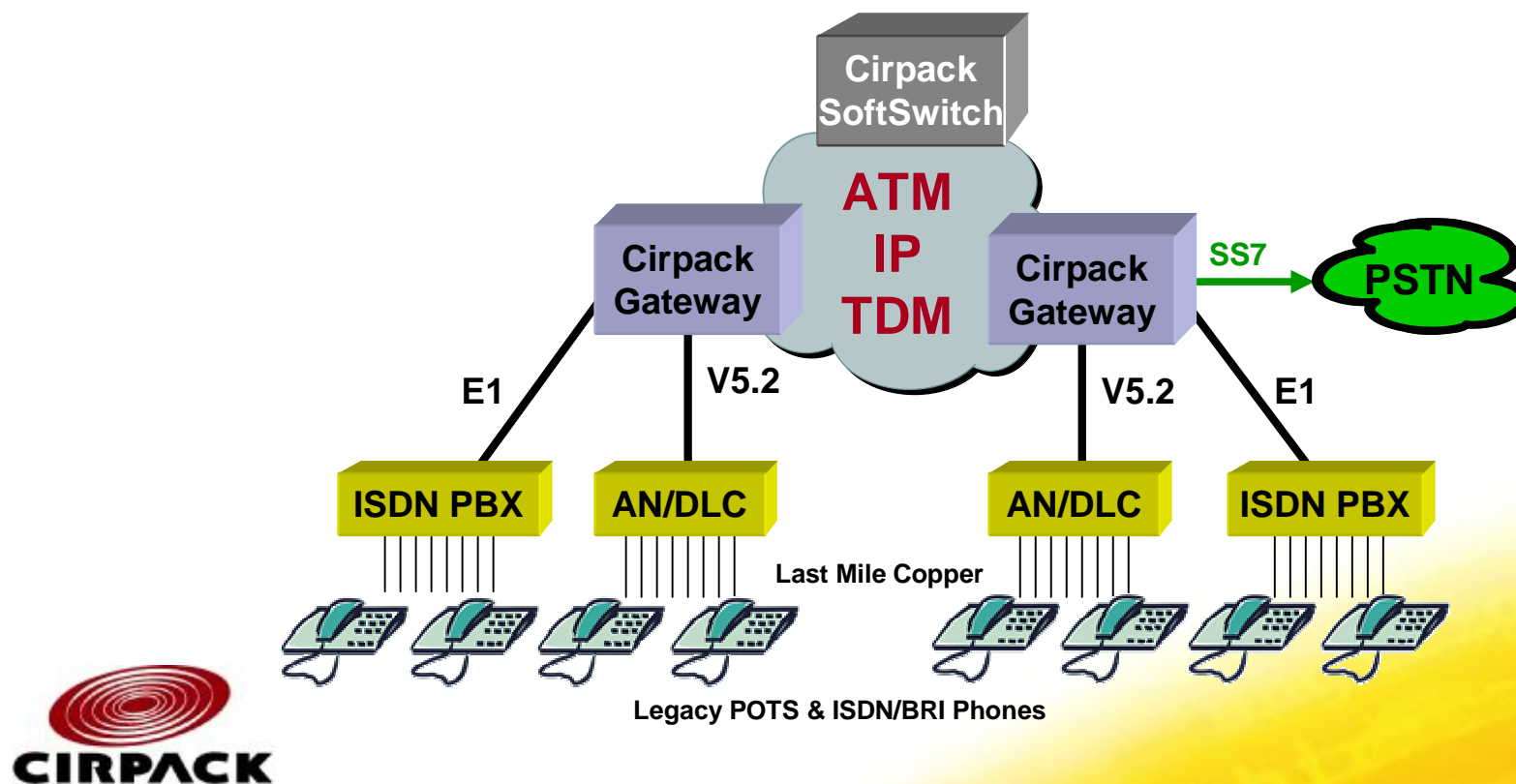
Value Added Voice Services

Introduction to Service Platforms

u **Definition**

- Service Platforms deliver software intelligence needed to manage enhanced voice services tailored to the unique needs of an operator
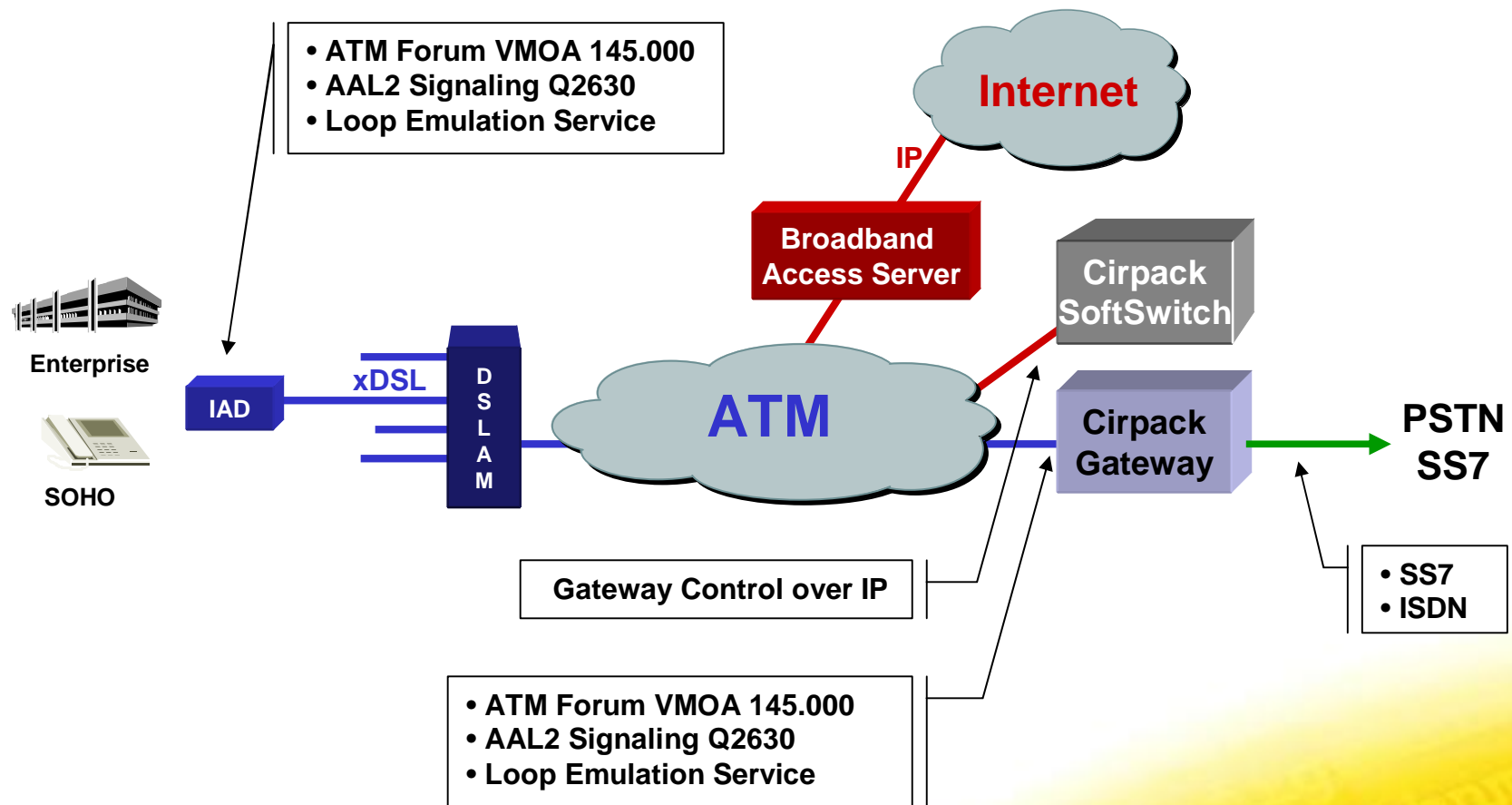
u **Examples**

- 800/900 Numbers
- PrePaid/Post Paid Cards
- Voice Mail/Unified Messaging
- Self Provisioning
- Universal Number/Follow-Me
- Voice VPN
- IP Centrex
- Computer Telephony Integration (CTI)
- Automatic Call Distribution (ACD)
- etc.

CIRPACK

VoDSL Solutions

VoDSL with Cirpack Switch

- ATM Forum VMOA 145.000
- AAL2 Signaling Q2630
- Loop Emulation Service

Internet

IP

Broadband Access Server

Cirpack SoftSwitch

Enterprise

SOHO

IAD

xDSL

DSLAM

ATM

Cirpack Gateway

PSTN SS7

Gateway Control over IP

- SS7
- ISDN

- ATM Forum VMOA 145.000
- AAL2 Signaling Q2630
- Loop Emulation Service

CIRPACK

Wide Choice of Certified IADs

- u **Residential and Corporate (POTS, ISDN BRI and PRI)**
- u **Modular and Scalable**
- u **Certified with Cirpack V5.2 Gateway (TDM architecture) and Cirpack Class-5 SoftSwitch (NGN architecture)**

CIRPACK

- Switch to the alternative !™

VoIP Solutions

Quick VoIP Signaling Brief

u **H.323**
- Legacy protocol to deliver multimedia services over IP, including voice
- Wide choice of products and providers, but difficult to maintain in a public telephony environment. Poor control over users traffic and services delivered

u **SIP**
- Emerging protocol for opening multimedia sessions over IP
- Wide industry commitment, good standardization, many solutions are now shipping
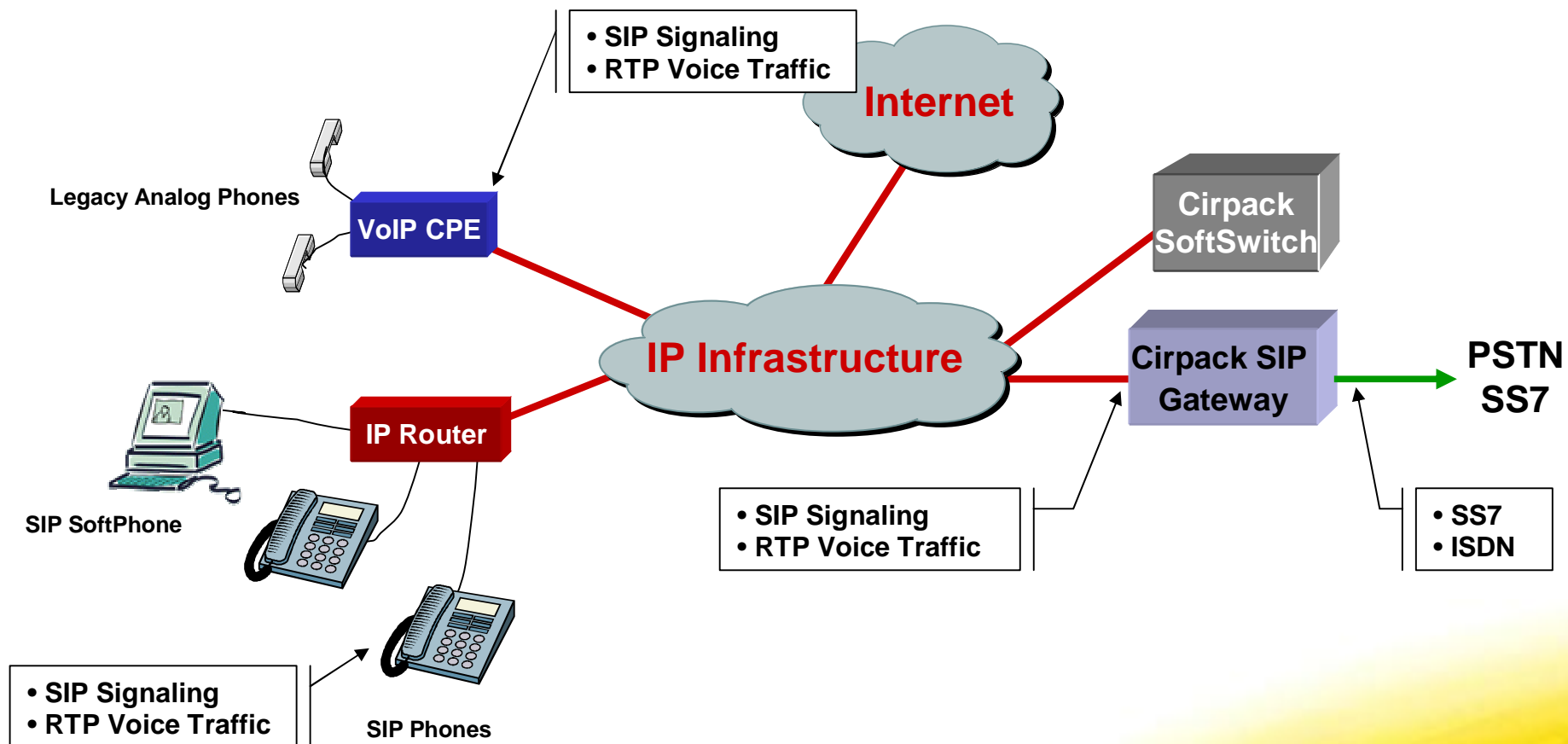- Poor control over users traffic and services delivered

u **MGCP**
- Established protocol to control user ports over IP
- Wide industry commitment, good standardization, many solutions are now shipping
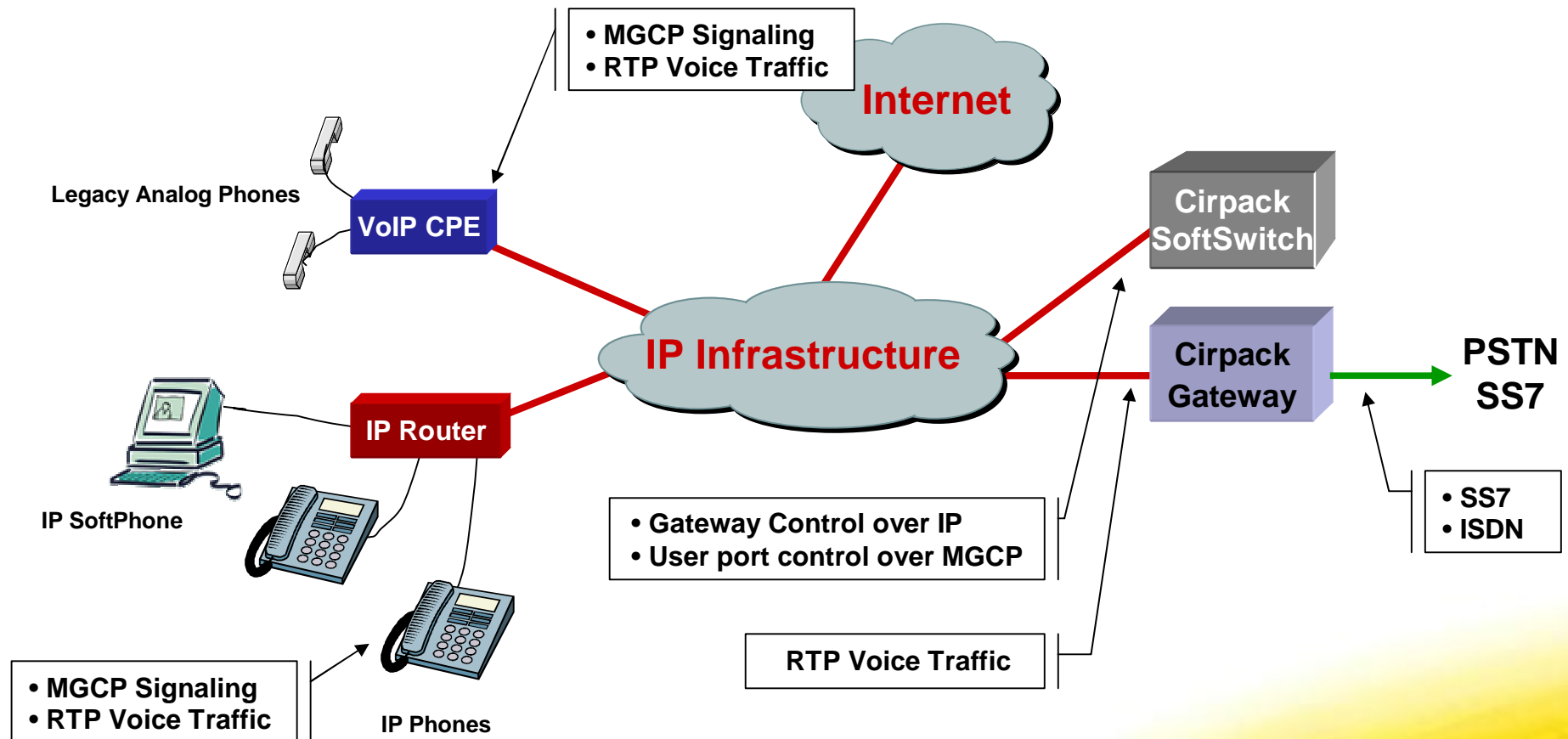- Master/Slave behavior allows for strong control of users traffic and services delivered

u **H.248/Megaco**
- Modern protocol to control media gateways over IP
- Wide industry commitment, recent standardization, only few solutions available yet

CIRPACK

Delivering VoIP Services
Using SIP

- SIP Signaling
- RTP Voice Traffic

Internet

Legacy Analog Phones

VoIP CPE

Cirpack SoftSwitch

IP Infrastructure

Cirpack SIP Gateway

PSTN SS7

SIP SoftPhone

IP Router

- SIP Signaling
- RTP Voice Traffic

- SS7
- ISDN

- SIP Signaling
- RTP Voice Traffic

SIP Phones

CIRPACK

Delivering Managed VoIP Services
Using MGCP/NCS

- MGCP Signaling
- RTP Voice Traffic

Internet

Legacy Analog Phones

VoIP CPE

Cirpack SoftSwitch

IP Infrastructure

IP Router

Cirpack Gateway

PSTN SS7

IP SoftPhone

- Gateway Control over IP
- User port control over MGCP

- SS7
- ISDN

- MGCP Signaling
- RTP Voice Traffic

IP Phones

RTP Voice Traffic

CIRPACK

VoCABLE with Cirpack Switch

- MGCP/NCS Signaling
- RTP Voice Traffic

Internet

SOHO

HFC

Residential

MTA

C M T S

IP Infrastructure

Cirpack SoftSwitch

Cirpack Gateway

PSTN SS7

- Gateway Control over IP
- MTA control over MGCP/NCS
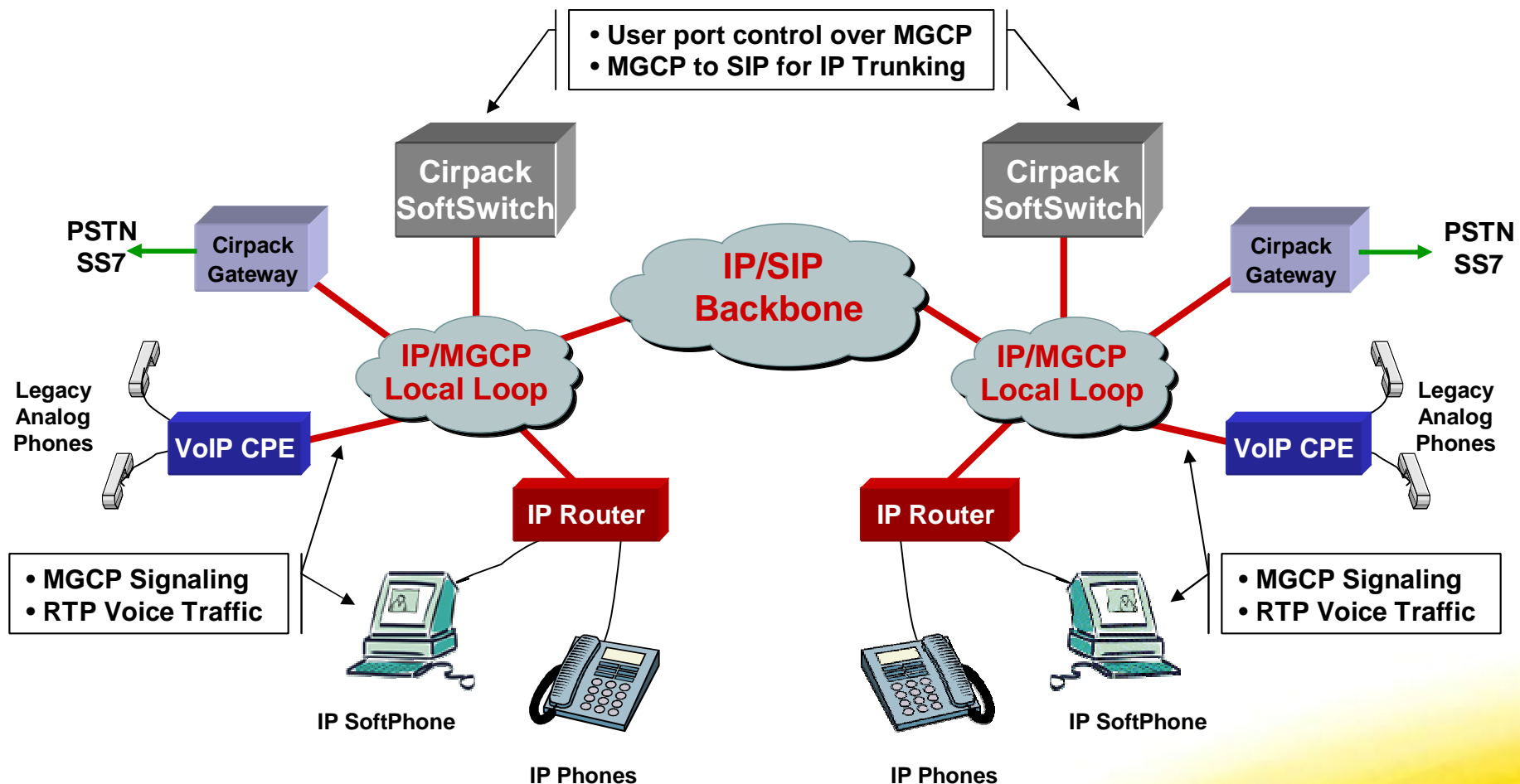
- SS7
- ISDN

RTP Voice Traffic

CIRPACK
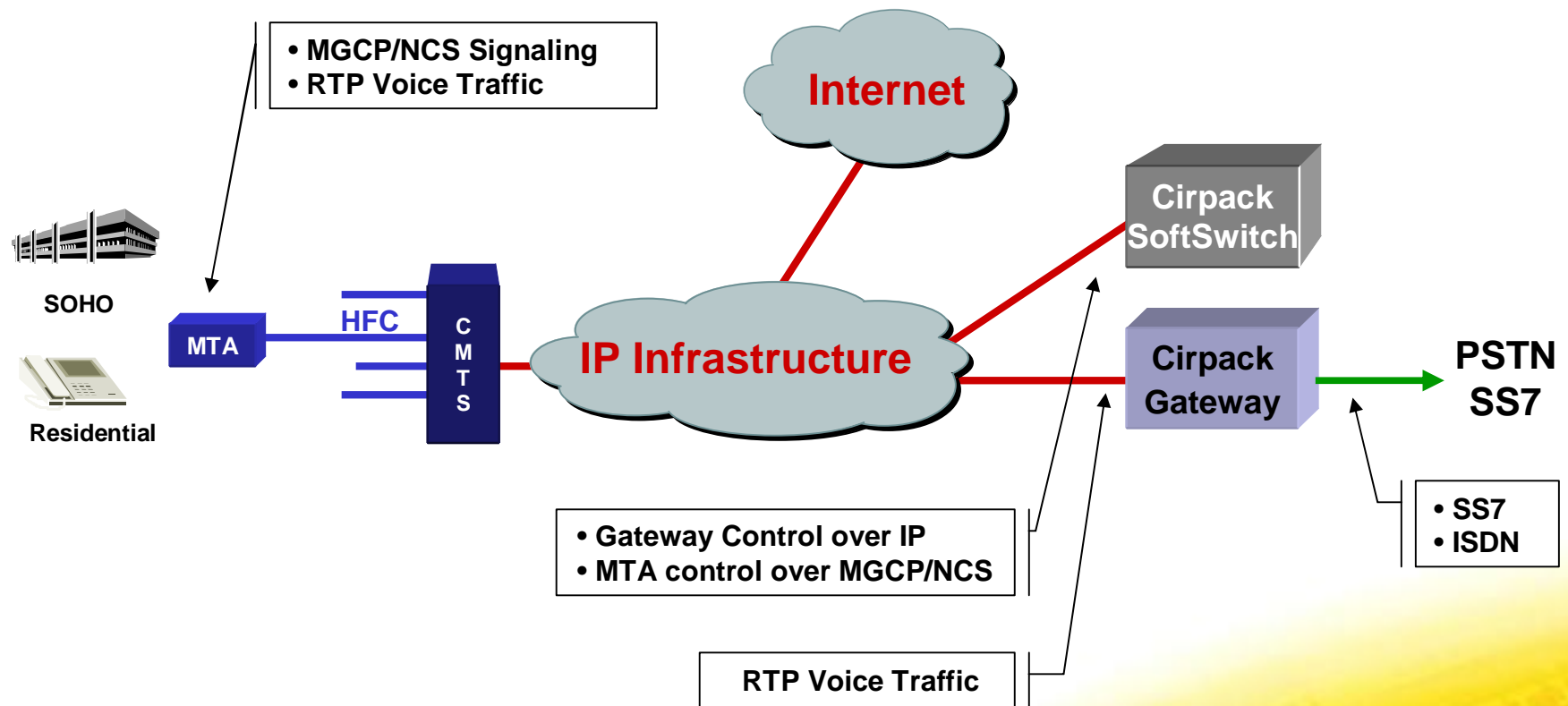
Wide Choice of Certified VoIP CPEs, Phones and SoftPhones

- u **Residential and Corporate (POTS, ISDN BRI and PRI)**
- u **Using SIP and or MGCP/NCS**
- u **With Ethernet Uplink or Built-in DSL/Cable Modem**

MGCP in the Local Loop, SIP in the Transit

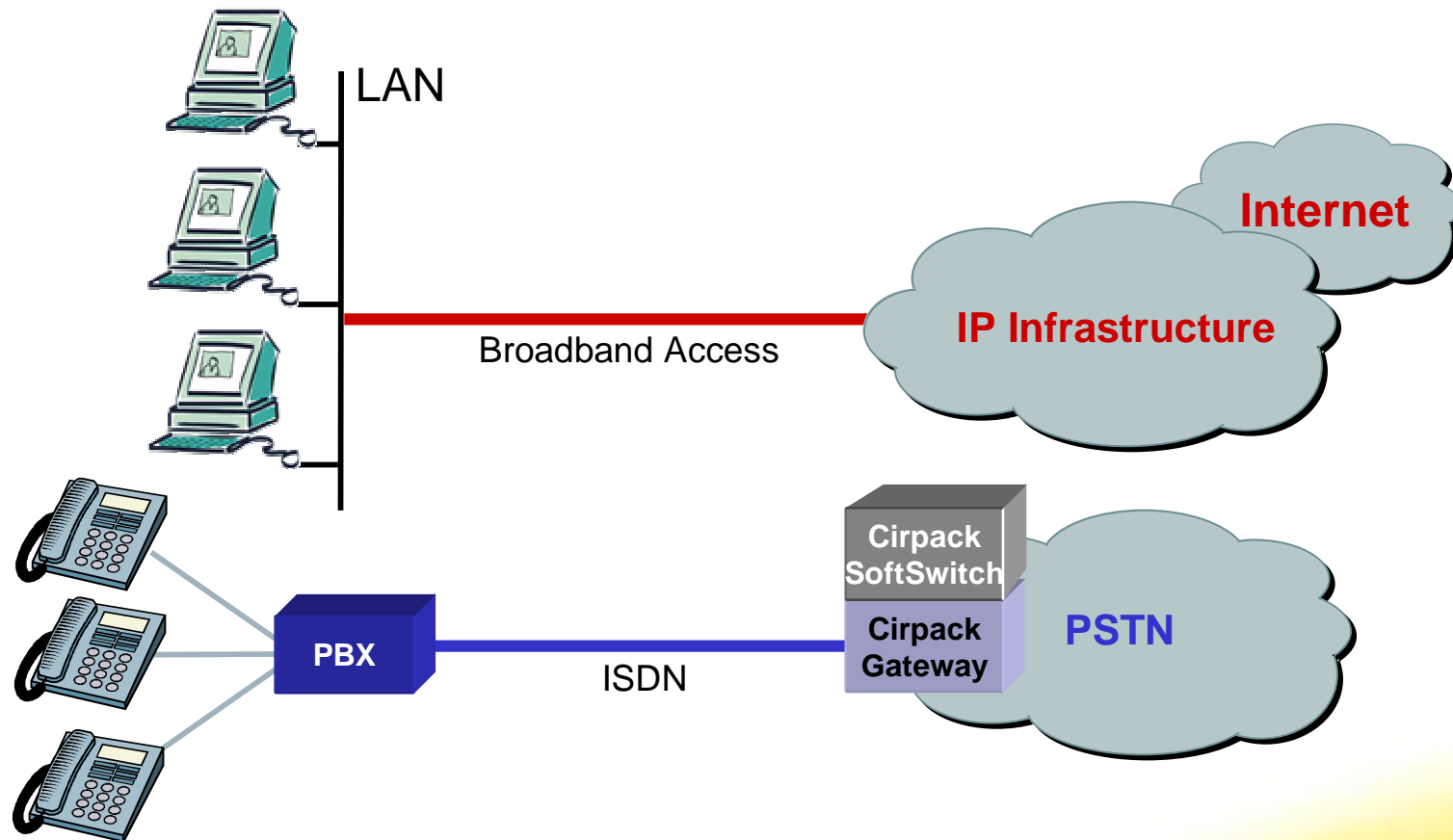- User port control over MGCP
- MGCP to SIP for IP Trunking

Ø RTP voice traffic goes directly from MGCP CPE to Cirpack PSTN Gateway
Ø MGCP is interworked to SIP by Cirpack SoftSwitch for trunking over IP backbone
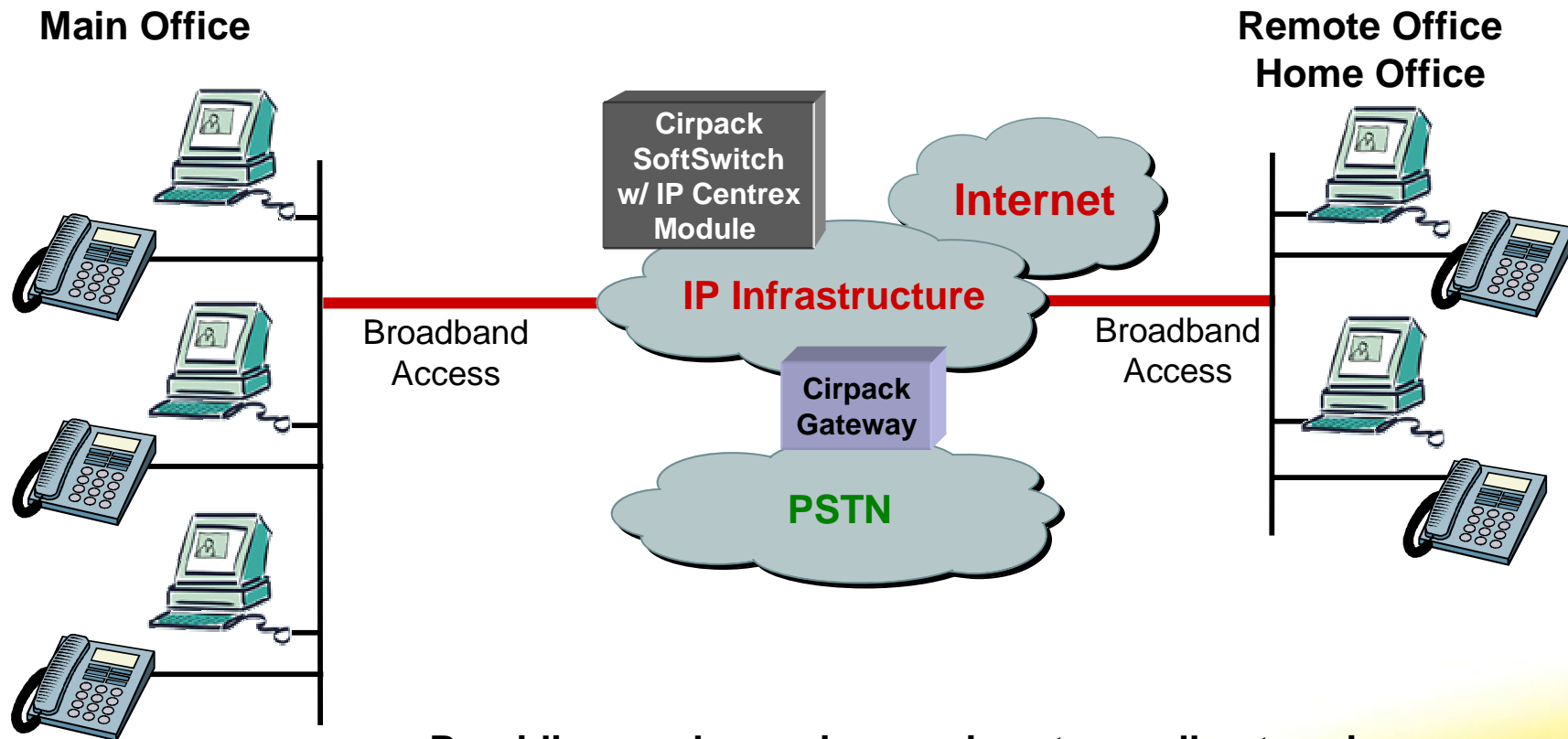Ø No useless IP/TDM/IP conversion in the backbone

IP Centrex Solution

The Legacy Infrastructure

LAN

Internet

IP Infrastructure

Broadband Access

Cirpack SoftSwitch

Cirpack Gateway

PBX

ISDN

PSTN

CIRPACK

The Cirpack Infrastructure

Main Office

Remote Office
Home Office

Cirpack
SoftSwitch
w/ IP Centrex
Module

Internet

Broadband
Access

IP Infrastructure

Cirpack
Gateway

Broadband
Access

PSTN

u **Providing modern voice services to small enterprises**
u **Lower cost and increased benefits for customers**
u **Higher ARPU for Telcos**

CIRPACK

Cirpack's IP Centrex Delivers PBX-like Features

u **A full set of field-proven telephony features**

- Direct dial in (DDI) / Distinctive ringing
- Multi-line services: Call hold, Call waiting, up to 6-way calling, Conference service
- Abbreviated numbers / Speed dialing / Private dial plans
- Do not disturb / Call diversion / Call forwarding (CFU/CFB/CFNR)
- Last call redial (Inbound, Outbound)
- Caller ID (CLIP/CLIR and COLP/COLR)
- Call screening / Call blocking / Outgoing calls restriction / Automatic Night Services
- Call logs (Missed, Inbound, Outbound) / Message Waiting Indication
- Line supervision / Call interception / Hunting groups
- "Hot-desk" feature (login on the phone)
- Music on hold
- Emergency number, Lawful interception
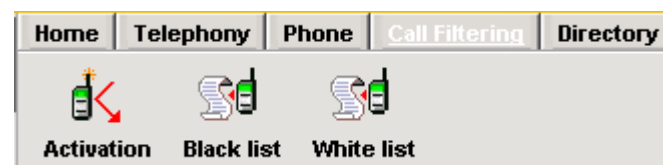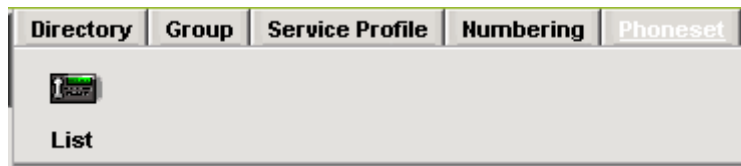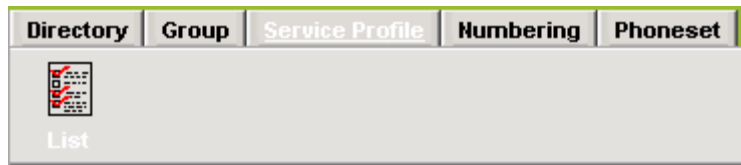- System Metering Detail Recorder
- Others…

u **Voice Mail**

- Via a third party Voice Mail System (connected to the Cirpack switch via ISUP, ISDN or SIP)
- Third party platforms allow Unified Messaging and advanced Message Waiting Indication

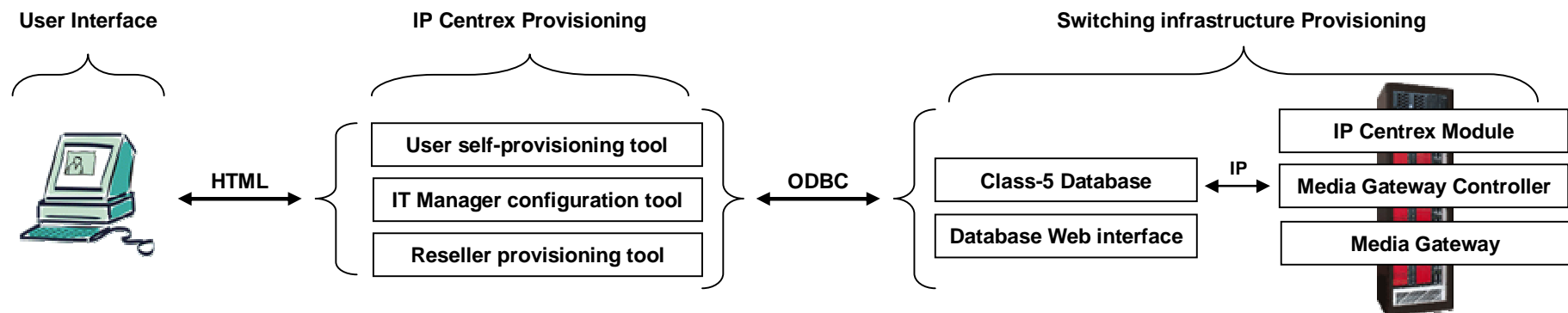**CIRPACK**

Easy Web-based Administration

Provisioning tools for the Operator, the Reseller, the IT Manager and the User

Cirpack's IP Centrex Provisioning Platform

u **Provisioning tools adapted to each type of configuration**

- End-user self-provisioning (User tool, IT manager tool)
- Operator set-up (Reseller tool, Wholesaler tool)

User Interface

IP Centrex Provisioning

Switching infrastructure Provisioning

HTML

User self-provisioning tool

IT Manager configuration tool

Reseller provisioning tool

ODBC

Class-5 Database

Database Web interface

IP

IP Centrex Module

Media Gateway Controller

Media Gateway

u **Easy integration into existing provisioning platforms via ODBC**

CIRPACK

Thank you!
Questions?