Solving IMS problems using P2P technology

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IIR Know how to achieve

Adrian Georgescu - biography

- Founder and CEO of AG Projects
- Co-chair of Dutch SIP SIG working group
- Member of OpenSER management board
- Member of ETSI ENUM special task force

AG Projects profile

- Established in 2002
- We provide simple solutions for complex problems
- Our product: a scalable turnkey platform for IP communications based on SIP and ENUM protocols
- Our customers are cable companies, DSL and telco operators

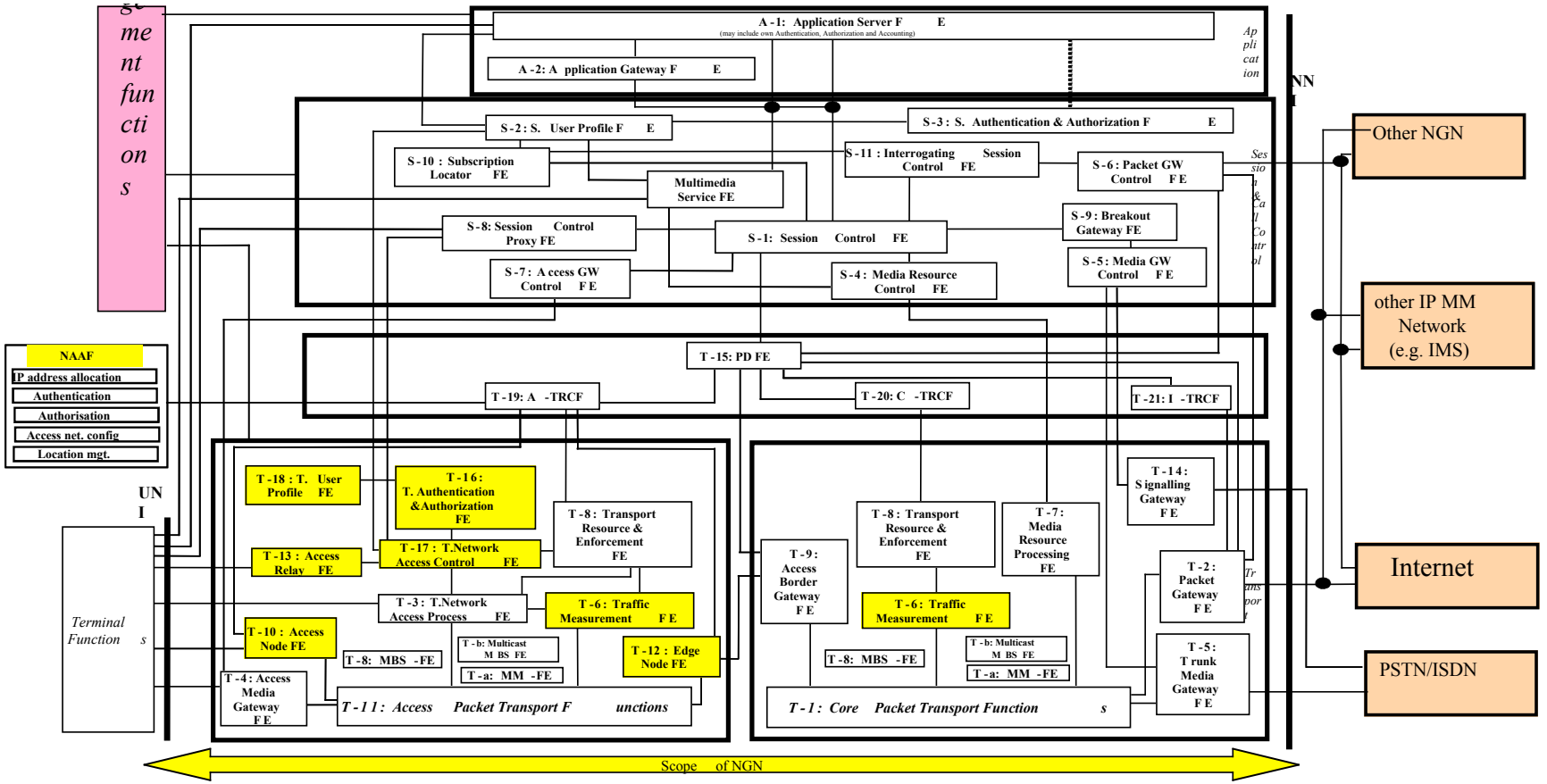
Short history of PSTN

- PSTN is a centralized network where various elements are chained to provide a voice service
- The service follow a “create and manage bottleneck” architecture
- The need for cost effective growth and the possibility of introducing services brought NGN in the picture

Introduction to Next Generation Network

- NGN is a model proposed by ITU-T that aims to implement a a model similar to PSTN by using Internet protocols
- network is application aware
- control resides in the network
- QoS is a matter of central control

ITU-T NGN System Architecture



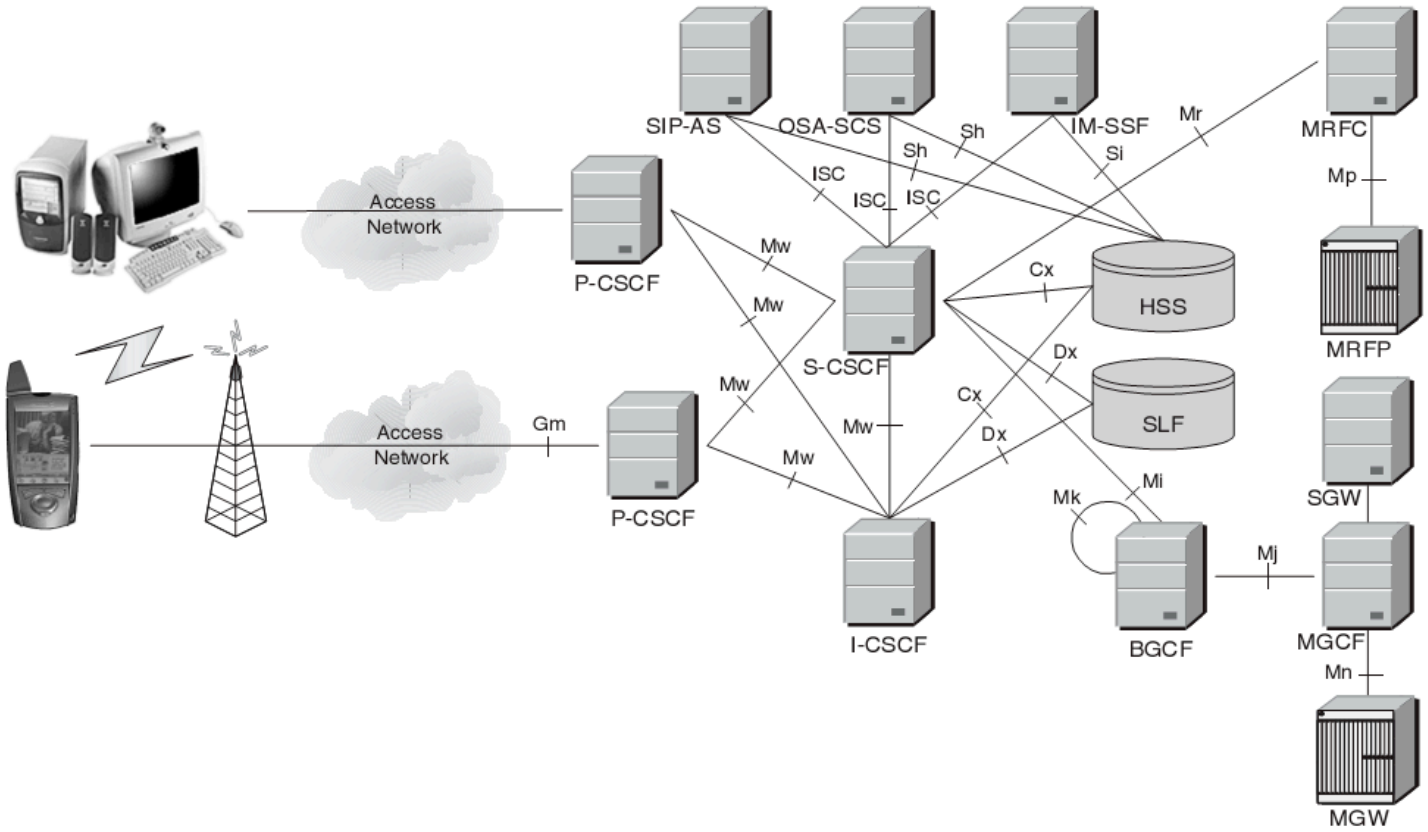
Motivation for IP communications

- Lower the operational expenditure by converging the data and voice networks into one single network (cost reduction)
- Increase revenues by introducing new services beyond traditional voice services (generate revenues)

IMS, the NGN solution for mobile networks

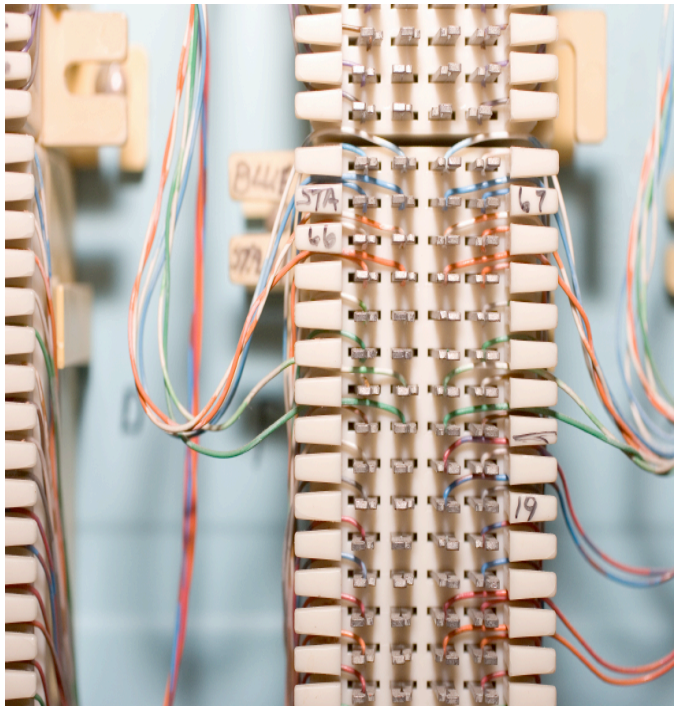
- IMS initially developed by 3GPP to replace the mobile networks
- Based on an operator controlled, walled-garden Internet
- Based on the SIP protocol developed within IETF
- Internet protocols have been chosen for their efficiency while trying to maintain a closed network

3GPP IMS Architecture – all subsystems

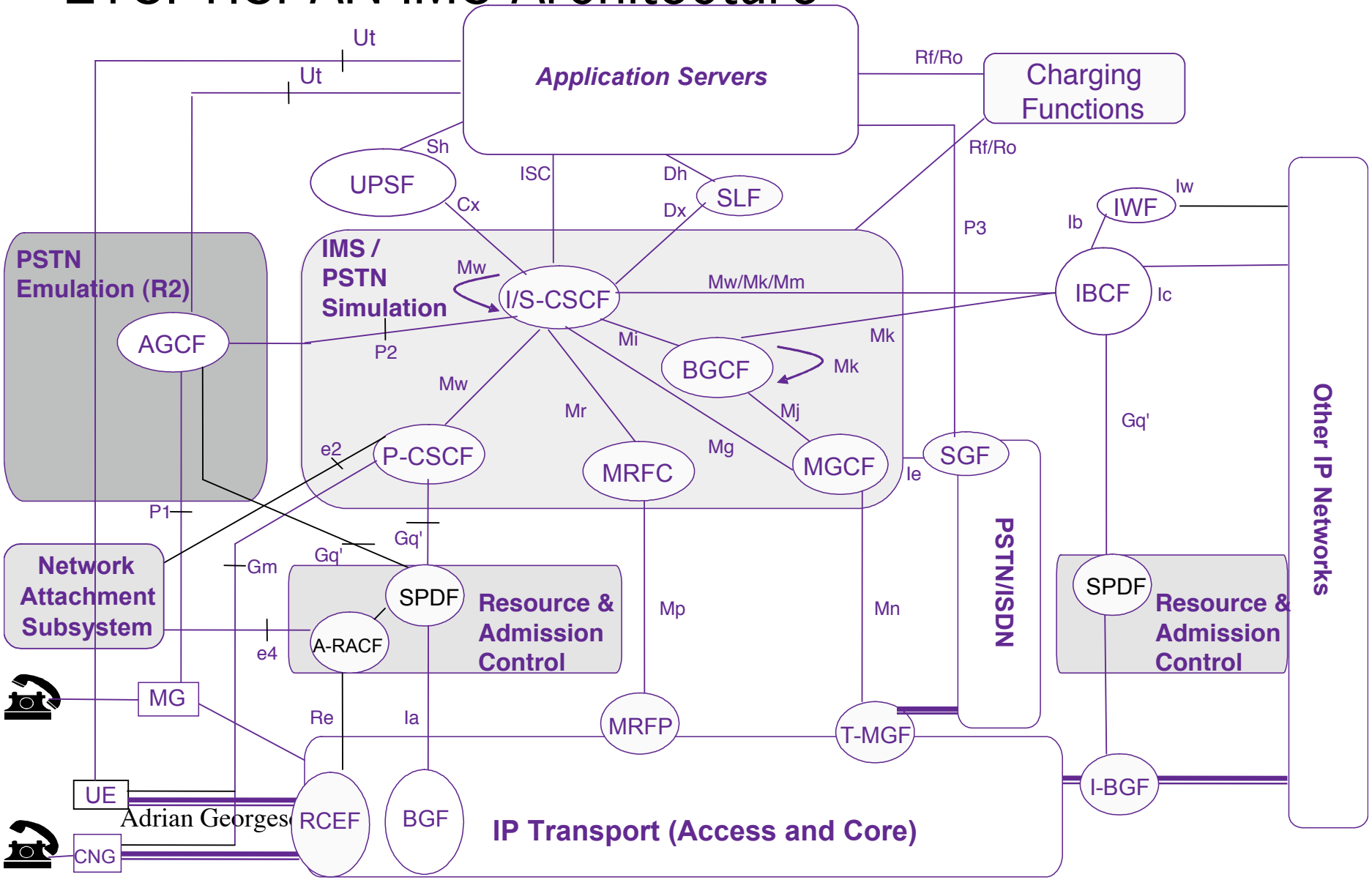


IMS, the NGN solution for fixed networks

- IMS was designed to implement an all-IP telecommunications environment for the fixed line operators too
- IMS supported by ETSI (TISPAN) with its extensions for the fixed line networks (DSL/cable)
- Based again on an operator controlled, walled-garden Internet



ETSI TISPAN IMS Architecture



IMS is clogged with technical problems

- Follows a classic telephony design with chained components, enforcing resource scarcity
- End-to-end communication not possible between end-points
- Innovation possible and allowed only in the network core
- Complexity. 12 components with at least 22 interfaces.

Why is IMS so complex?

- decomposing devices into most granular functions and links
- tracking and controlling user behavior
- The proliferation of boxes and protocols for the state management required for data tracking leads to cognitive overload but adds little value.
- Complexity is ugly

IMS costs are prohibitive

- Cost of deployment
- Cost of maintenance, many components, boxes, links
- Development costs, services deployed only from the core
- It will deliver for a huge cost less than your consumers got from Skype yesterday

Who needs walled gardens anymore?

- Telecom industry is definitely not known for its innovations
- What's wrong with enabling new services from the edge?
- Raising barriers cost money and returns nothing back
- By the time you finish raising up your walled garden, the customers are safely outside

Internet is simple and simple is beautiful

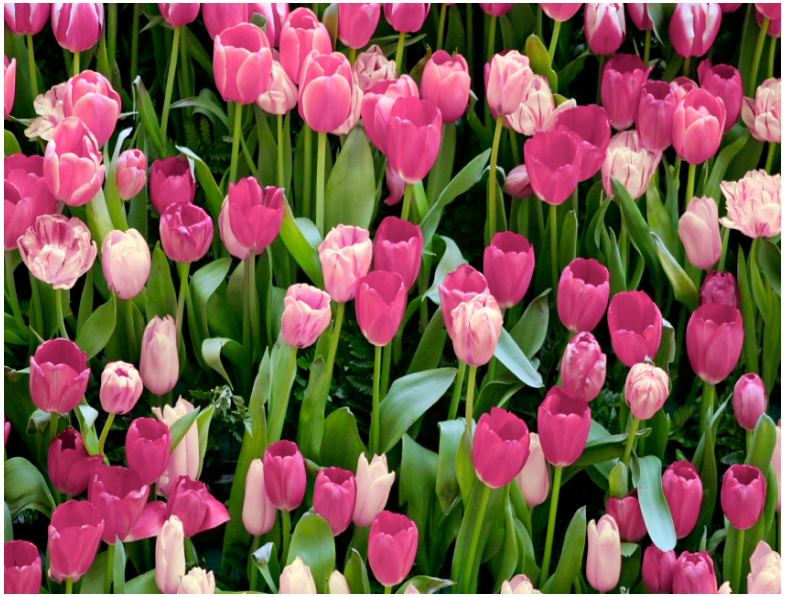
- Internet is a simple network
- Internet services (called applications) are performed at the edge
- More CPU power on the edge, more applications available
- Increase of bandwidth eliminates the source of QoS problems
- It is based on **the end-to-end principle**

the end-to-end principle of the Internet

- Network is unaware of the applications, this makes it scalable
- Nothing should be done in the network that can be done in an end-system
- Quality of Service (QoS) is a matter of bandwidth availability and not of central control

Why do Internet business models flourish?

- Services are available on the edge, spread virally
- Internet is an “eat all you can” model based on flat fees
- New applications are rolled out faster then ever
- Free services attract naturally large amount of users to premium services



Real-time communications over the Internet

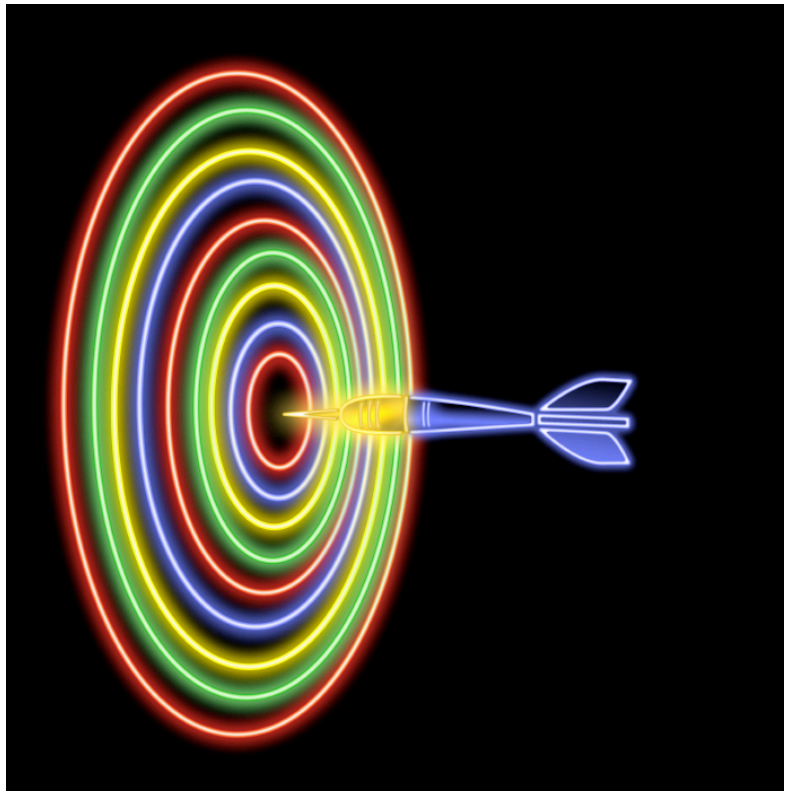
1. SIP - Signalling protocol to setup and close sessions
2. ENUM - Translate telephone numbers into SIP addresses
3. Presence - enable applications beyond voice
4. P2P - scalability and operational cost reduction

P2P - the most successful Internet application

- Widely known for file-sharing and IM applications
- P2P today accounts for more than 70% of the Internet traffic
- What P2P does, it creates an overlay network for a set of specific applications
- P2P provides actually a suite of technologies that solves today the problems of IMS

What makes P2P a successful technology?

1. Join/Leave: Nodes may come and go at any time, the network topology reconfigures itself
2. Lookup: The network can locate deterministically the node that serves a specific user or service
3. Routing: The network can route a message regardless of network topology changes and without manual re-configuration

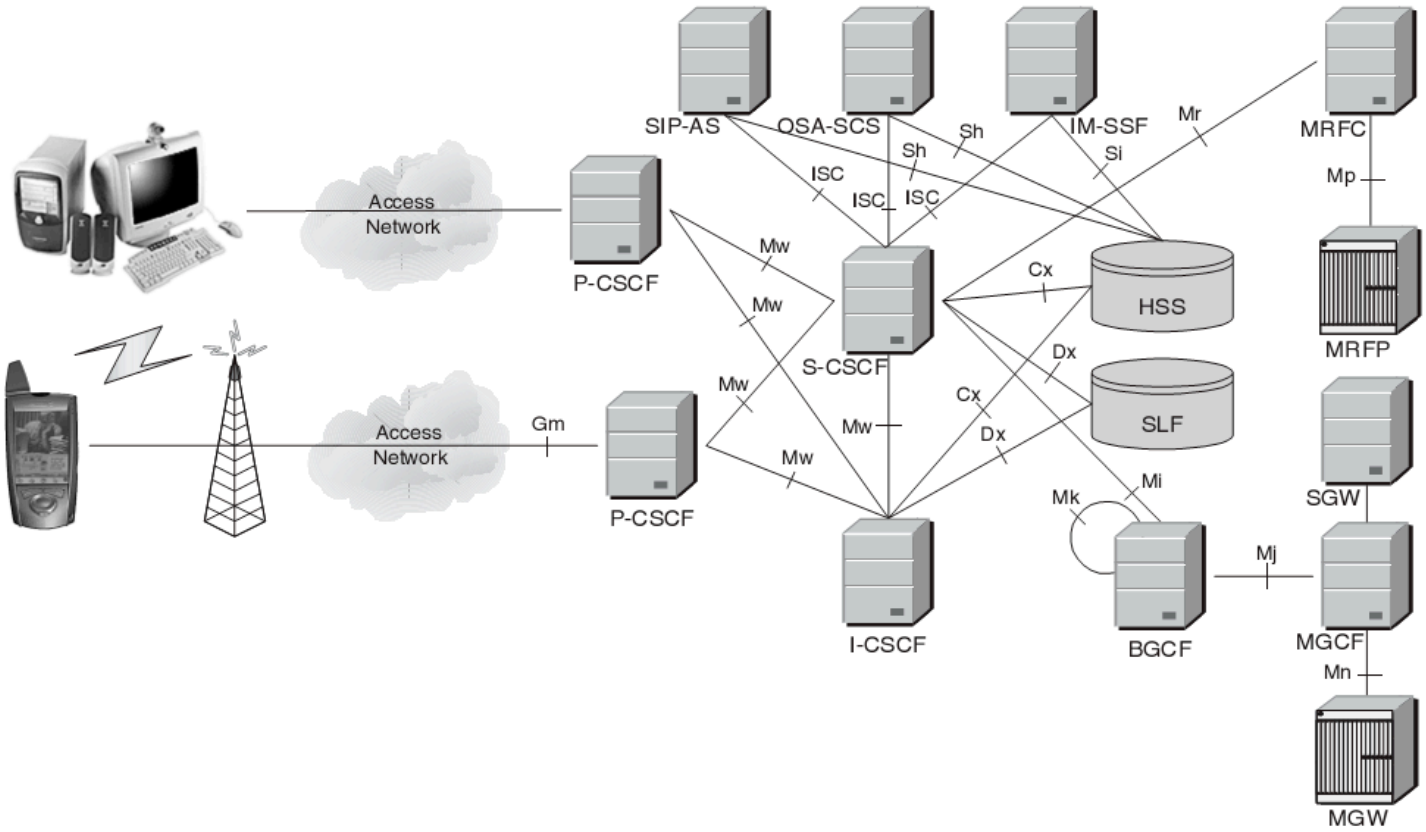


Why is P2P technology cost effective?

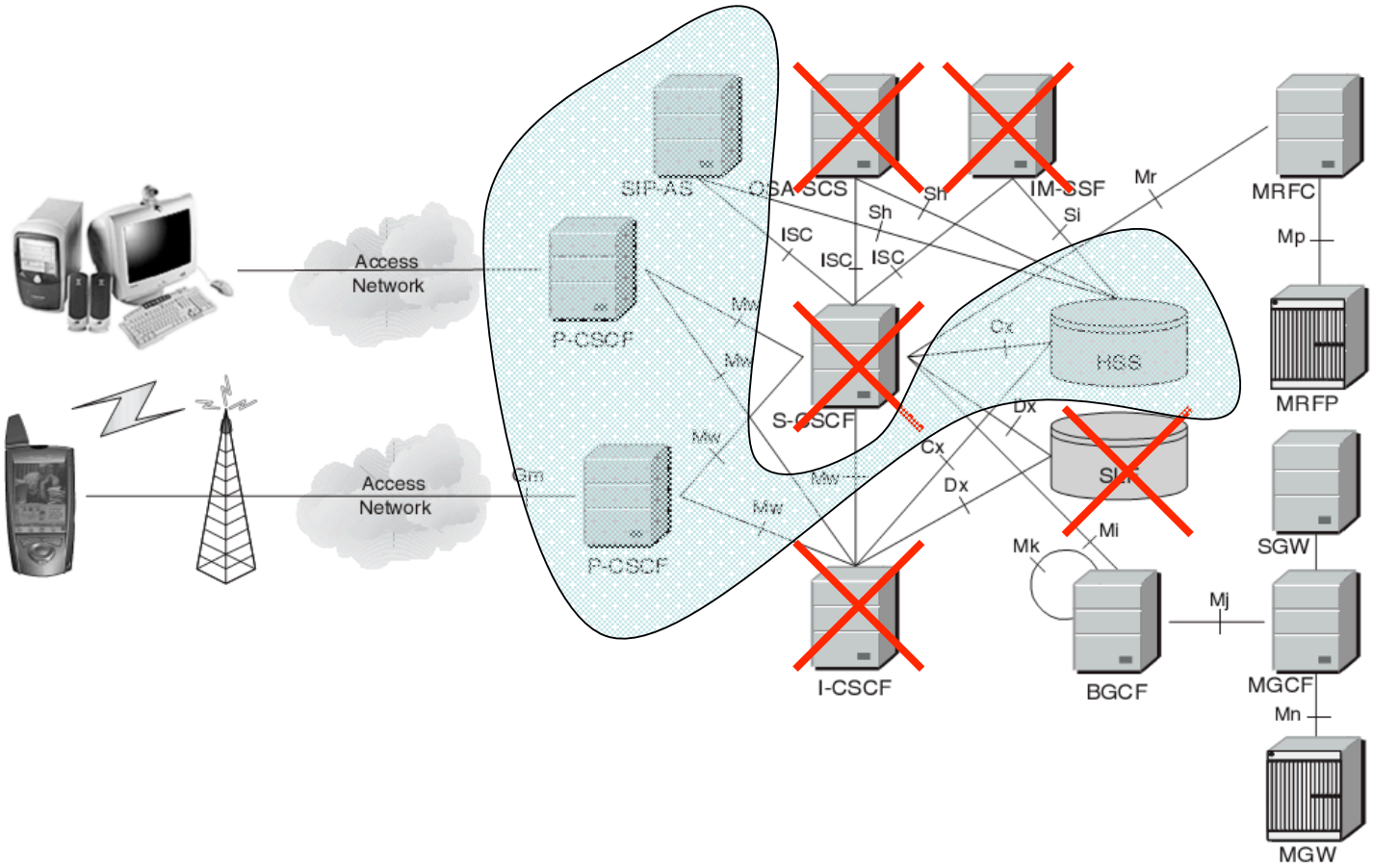
1. Self-organizing network (automatic disaster recovery)
2. Scalability limited by available hardware
3. Cheap hardware resources in place of expensive servers
4. No idle components, all hardware assets are used
5. No need for planned maintenance

How can P2P solve the problems of IMS?

Take only necessary functions from IMS



Many IMS functions are not useful



The necessary IMS functions

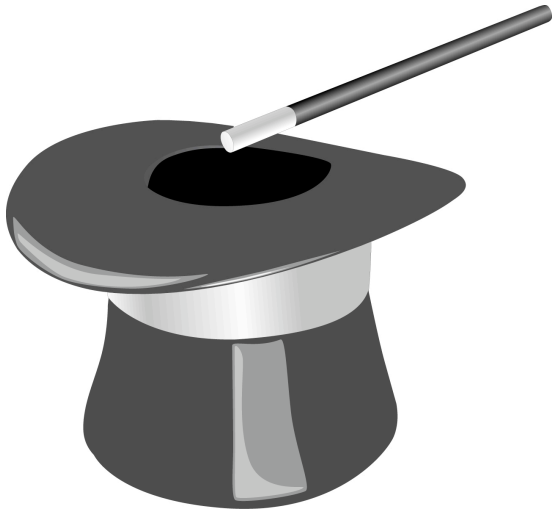
1. SIP Proxy/Registrar
2. Media Proxy
3. DNS/ENUM
4. Voicemail
5. Presence
6. User profile database
7. Accounting

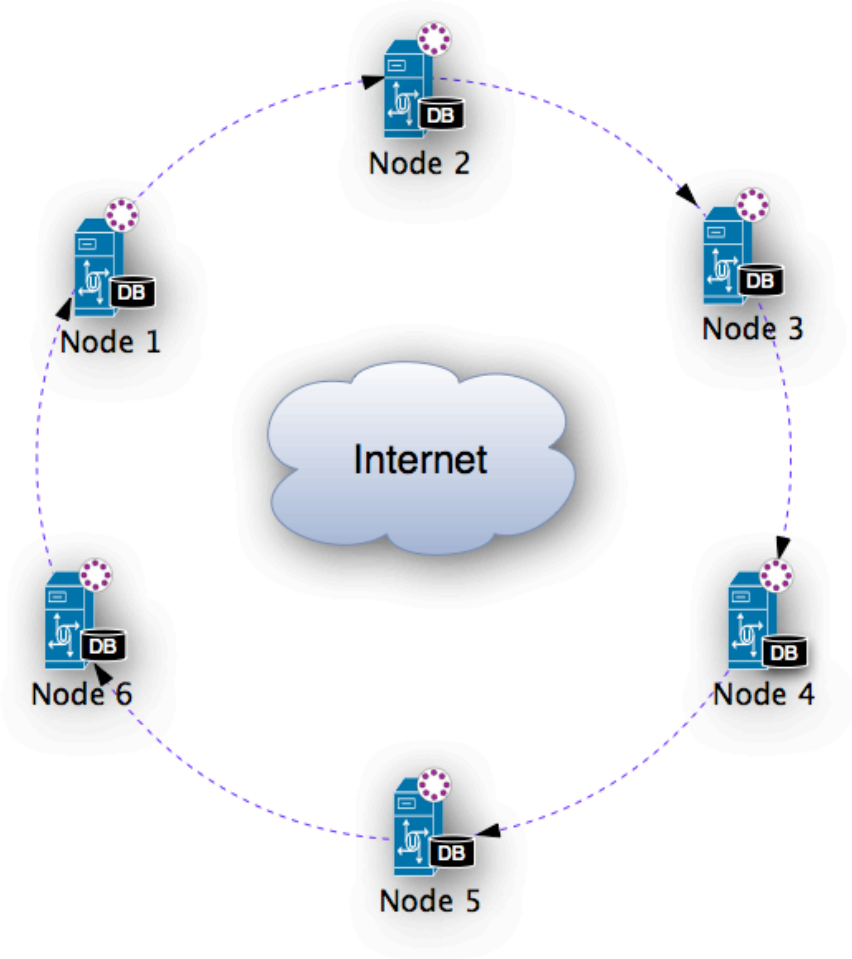
Fold all IMS functions into a single box

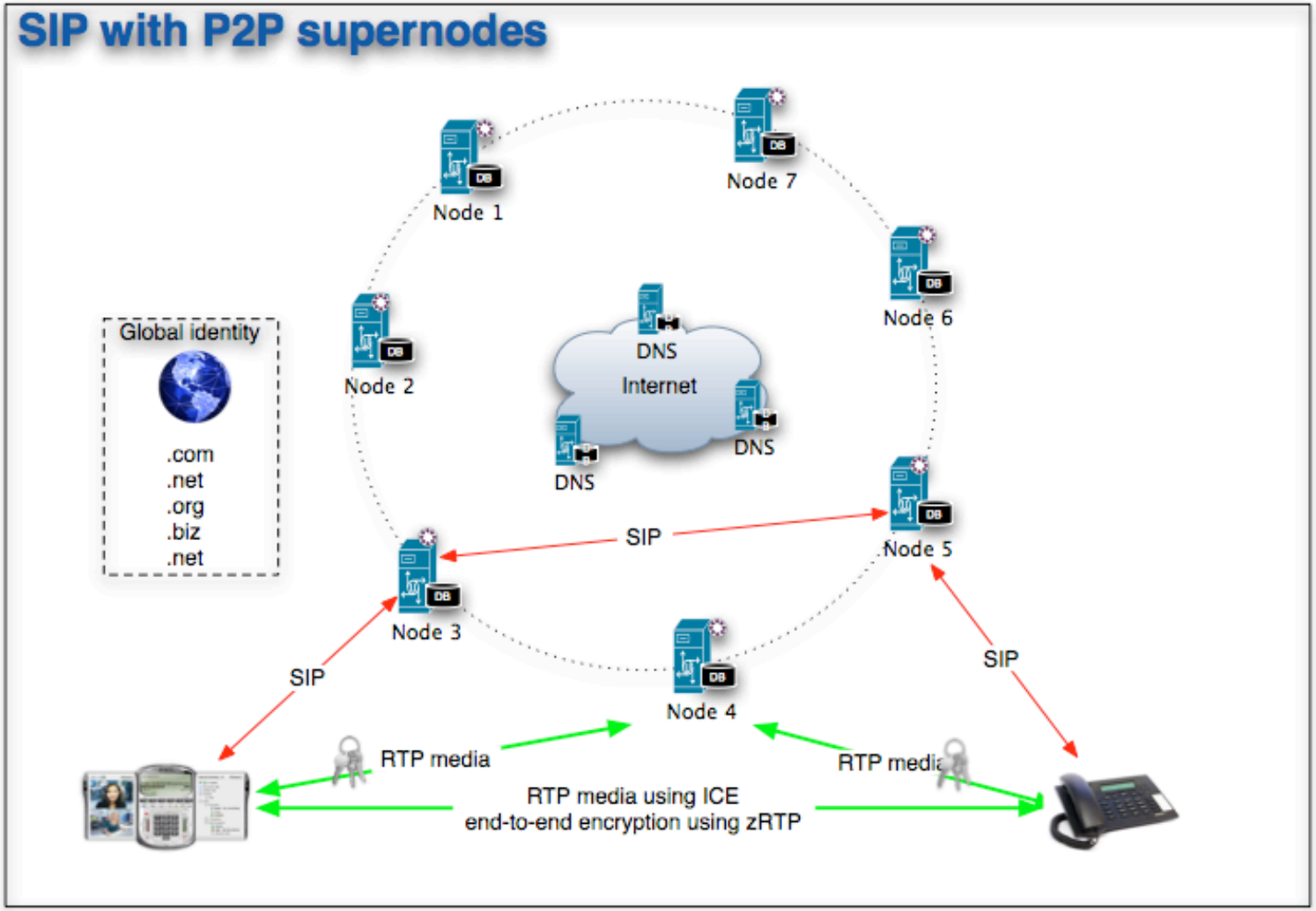
A single server today can handle 10K subscribers and 200 media sessions.

Play the hat-trick

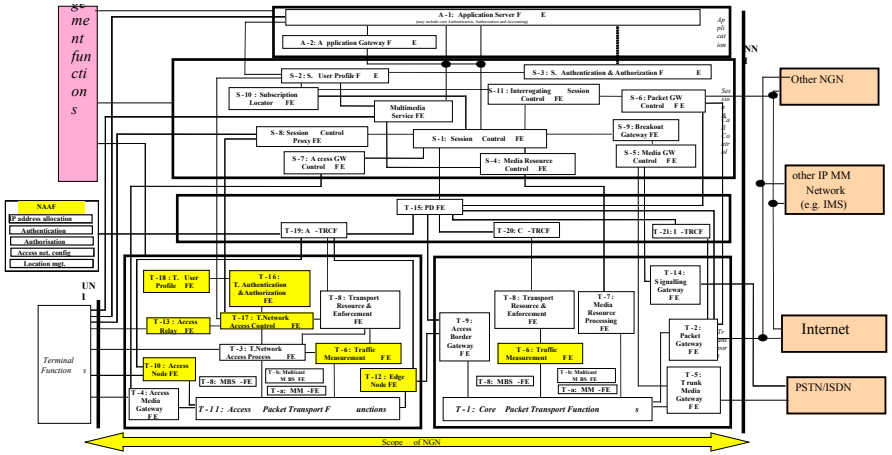
Build a self-organizing overlay network by using Peer-to-Peer technology and use the **IMS-in-a-box** as nodes

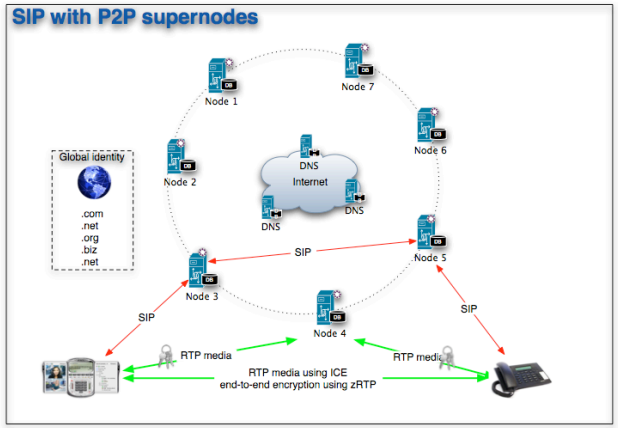



Node 2
Node 1
Node 3
Internet
Node 6
Node 4
Node 5
DB



From complexity to simplicity





From hard work

to easy accomplishments

Questions?

Thank you,

You may contact me at:
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