

# CAssiopeia Softswitch Application Sheet

Voice network requirements are growing together with services uptake, challenging Service Providers to implement solutions that enable network scalability, flexibility, reliability, high performance and low cost of ownership with IMS architecture concepts in mind.

Today, as VoIP takes off, it requires more than just basic functionalities. Service Providers need to distinguish between the different types of softswitches and their respective value propositions.

## Getting OUT of the BOX...

Many of the traditional switching vendors have implemented Softswitch solutions by adopting VoIP protocols to their legacy TDM switching technology or by implementing a "Telco in a box" concept.

### From Telco in a "Box" topology to Network Architecture

IPgallery is offering a new revolutionary approach!!

Using state of the art Grid Architecture, IPgallery presents a pure software based softswitch running on general purpose servers. The CAssiopeia softswitch is a next generation carrier-grade switch made of a collection of modular software components, function oriented, based on Grid architecture that provides high performance, scalability, distributed topology, geographical redundancy and load balancing in a unique network architecture.



# IPgallery! Its the Architecture...

## Grid architecture

The core of IPgallery's solution portfolio was developed on a unique Grid Architecture. This architecture enables communication between the different software modules, regardless of their physical location, either on a single server or multiple distributed servers. It also enables auto discovery of servers and applications, easy configuration, centralized management and more.

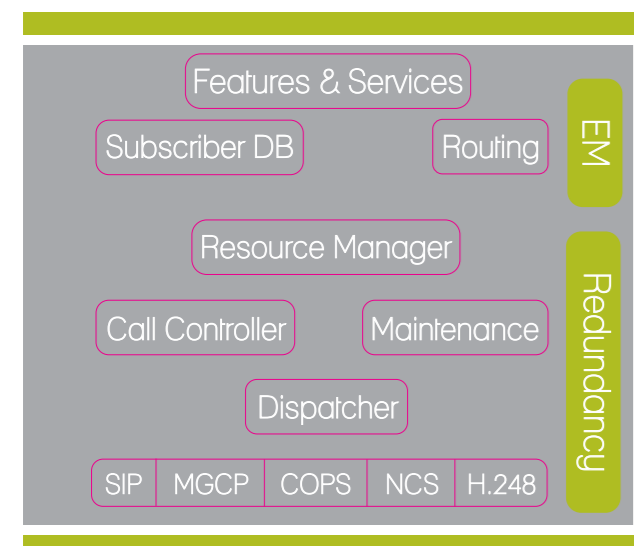
IPgallery's suite of products combines different software applications and modules that communicate through the Grid Architecture infrastructure.

The Grid - powered solutions provide unique CPU utilization efficiency, scalability, unlimited geographical distribution and a high level of robustness.

**Scalability** - IPgallery's solutions provide efficient and nearly unlimited scalability. An application can reside on single or multiple servers - depending on CPU power needed for a service. Customers can pay as they grow, adding CPU power only when and where needed.

This has been achieved by implementing Distributed Processing - efficient distribution of processing sessions among multiple processors environment using the Grid Architecture and enhanced threading techniques. It enables the distribution of processes among multiple hardware servers to expand capacity when needed.

## CMS building blocks



**Performance** - The Grid Architecture enables efficient communication between software components - not only between servers but also internally. This results in significant savings in CPU power, enabling IPgallery to have up to 300CAPS per server!

**Load Sharing** - the Grid Architecture enables load sharing between several processes on a single or multiple hardware platforms. It provides a real time dynamic load sharing of service requests between multiple servers.

**Distributed Topology** - The Grid Architecture is location agnostic, enabling the installation of different software modules at varied locations with geographical and functional distribution.

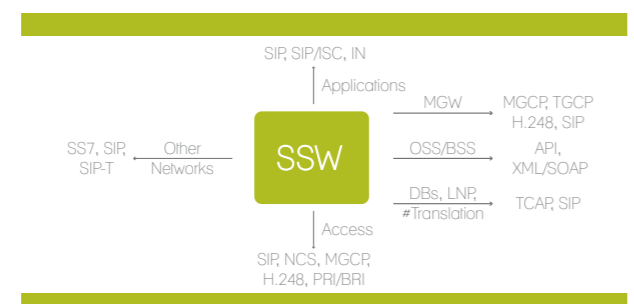
**Redundancy** - The Grid Architecture supports redundancy of software elements throughout the system. Because of its distributed topology it also supports Geographical Redundancy.

**Availability & Reliability** - IPgallery's solutions are highly reliable providing availability that exceeds 99.999%.

**Software Upgrades** - As the SSW is combined from different software applications and modules that communicate through the Grid Architecture infrastructure, each software component can be upgraded separately without affecting the others!

**In-house Protocol Stack Development** - All Signaling stacks used by the CAssiopeia suite of products were developed in-house, enabling far greater flexibility with special interoperability requirements for vendors/service extensions, adopting protocol flavors and short time-to-market in introducing new services. One stack instance can run on multiple servers, reaching unlimited capacity.

## Softswitch Interface



## CAssiopeia Softswitch

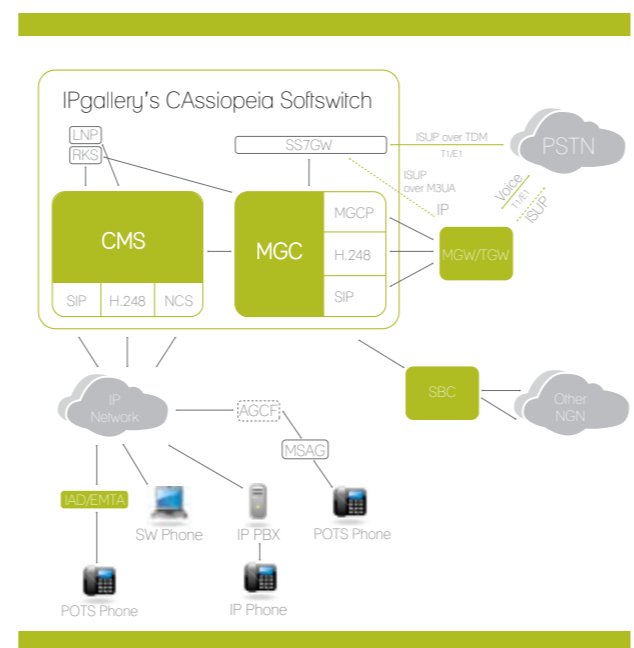
The CAssiopeia Softswitch is optimally designed for large deployments. The open interface supports rapid deployment of new, revenue generating features. Nevertheless, its pluggable software module concept and easy scalability, also allow a full Class 5 SoftSwitch performance over a pair of small servers for very small operators.

It supports very large payloads of wire-line voice traffic on different access networks such as: Cable (NCS), Telco (H.248 to MSAG or SIP to AGCF) and SIP IADs.

**The distributed architecture** can highly contribute to lower the call establishment price as well as lowering CAPEX and OPEX. An operator can install CMSs and MGCs as needed by the amount of internal and outgoing calls, install the CMS closer to the subscribers and the MGC at the interconnect points.

The General architecture of the CAssiopeia Softswitch and its software components is detailed in the figure below. This is a functional design, as more than one software element may reside on the same server or a software element may reside on multiple servers - depending on the needed CPU power.

## Softswitch Overview



The SoftSwitch is mainly composed of the following sub-systems:

- Call Agent or Call Management System (CMS) - Manages the subscribers and their features
- Media Gateway Controller (MGC) - Manages the Trunk Gateways and their supported Trunks
- SS7 Signaling Gateway (SG)

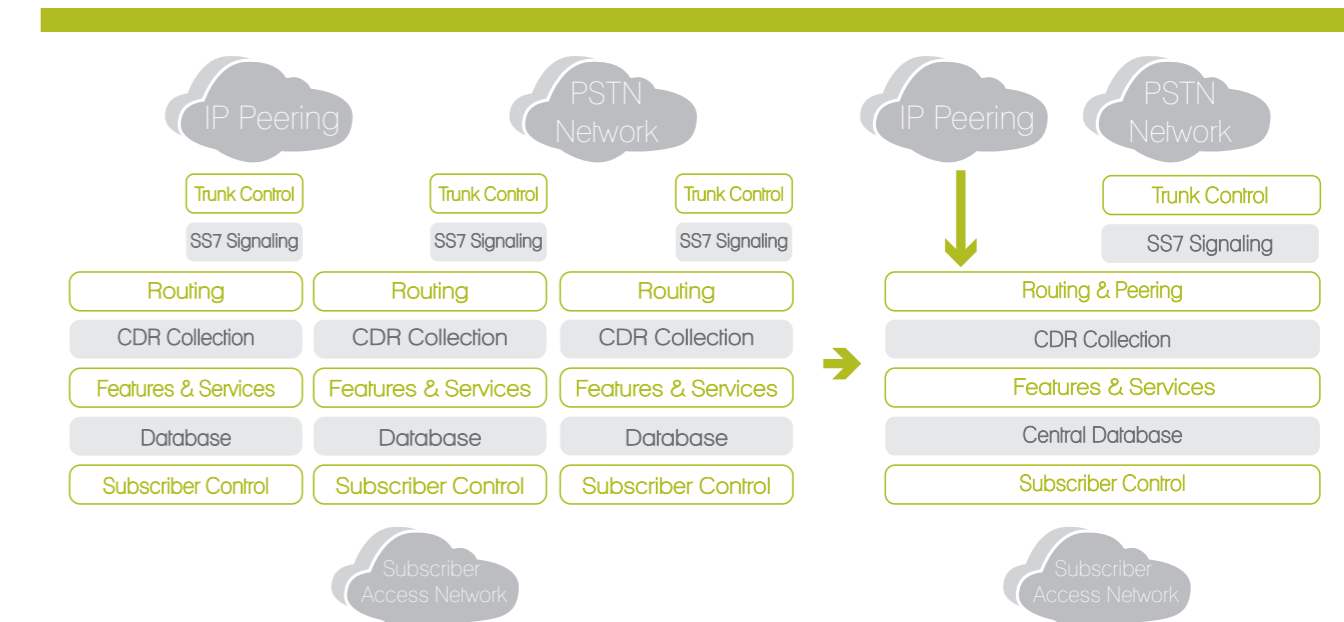
The CMS, MGC and SS7 SG are all fully redundant.

The Softswitch interfaces with many devices:

- **Media Gateway or Trunk Gateway** - Is used for interfacing the PSTN switches with the IP voice media.
- **SBC** (Session Border Control) - Allowing SIP peering when interfacing with other VoIP networks.
- **IAD/EMTA** - The IADs (SIP) or EMTAs (NCS) are the Residential Gateway units supports the telephony communication at the subscribe premises.
- **PBX**- Supporting Integrated Services Digital Network (ISDN) /Primary Rate Interface (PRI) and Basic rate Interface (BRI) access.
- **IP PBX** - SIP trunking to connect existing IP PBX.
- **MSAG** (Multiservice Access Gateway) - Manages the communication with MSAGs using H.248 or through AGCF (Access Gateway Control Function) using SIP, connecting analog subscribers.
- **Applications** - Accessing application servers using SIP, SIP/ISC and IN protocols.
- **RKS** - Record Keeping System - This unit collects the Event Message sent by the different modules and prepares the Billing data in a CDR format. The RKS has also capabilities of Mediating between the Softswitch and different CDR formats required by a Billing System.
- **LNP** - Query of LNP/MNP data bases.

## Switching from "Boxes" topology to Network Architecture

The Grid Architecture and software modules enable high scalability, thereby applicable to large scale deployments using a "single" Softswitch.



In "Telco in a box" topology the operator faces many disadvantages:

- Similar topology to legacy networks
- Lack of central subscriber DB to enable mobility
- Number ranges for each switch
- Complicated interworking between switches
- No topology hiding from other operators
- Complicate to launch external application servers
- High CapEx-adding a full switch with its gateways, re-configuring all other switches in the network

**Network Architecture** provides all the IMS benefits:

- Behaves as a single switch regardless the number of subscribers or trunks
- Centralized Database
- Centralized routing engine
- Topology hiding
- Smooth deployment of external application servers
- Lower CapEx-Adding SW modules and CPU power as needed

## Smooth Migration To IMS

IPgallery's Grid Architecture enables the creation of a functional structure by separating different logical functionalities and modules. This makes it easier to convert NGN components to components that fit the requirements of the IMS architecture-mainly by adopting SIP interfaces.

Therefore, deploying IPgallery's Network Architecture based Softswitch can be the first phase towards deploying IMS.

A software upgrade will convert the Softswitch to a full IMS configuration, keeping existing external interfaces and updating the internal SW modules and interfaces to SIP.

IPgallery has developed IMS solutions that comply with 3GPP, Tispan and PacketCable2.0 standards.