

The RadiSys logo is displayed in white serif font within a blue rectangular box with a subtle gradient and a slight glow effect. A thin black line extends from the right side of the box towards the right edge of the slide.

RadiSys.

DSPS Fest  
August 4, 2000

# Designing Open Standards Based Media Gateway

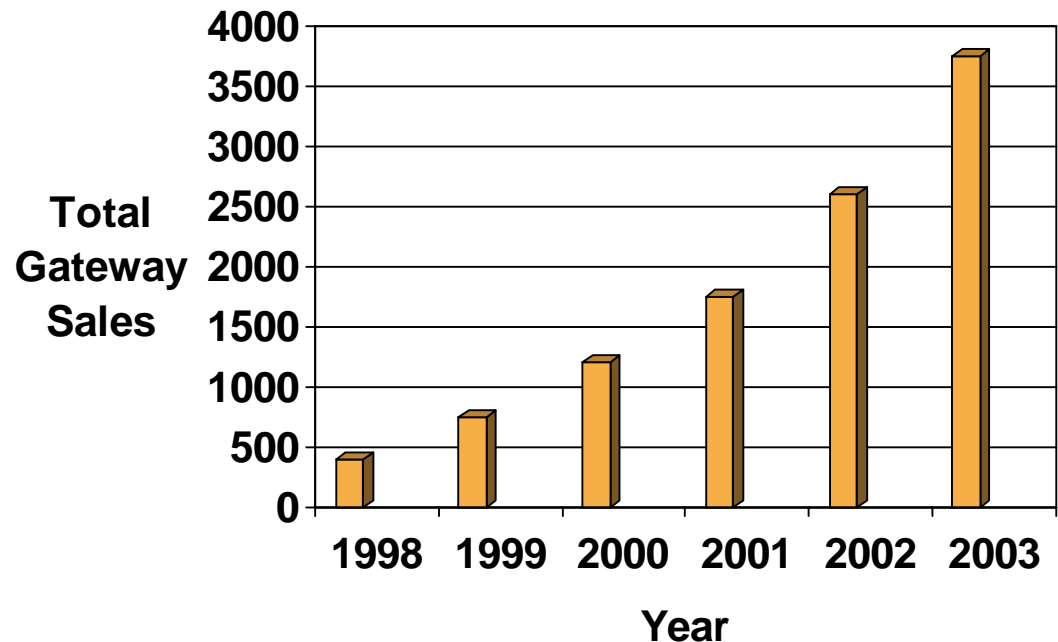
**Manish Kasliwal**  
**DSP Product Manager**  
**RadiSys**

## Abstract Summary

- **How to design an open standards based Media Gateway**
- **Emerging open standards in the industry**
- **How is RadiSys embracing them**
- **About RadiSys' Application Ready platform and other building blocks**

## 3Ws of VoIP?

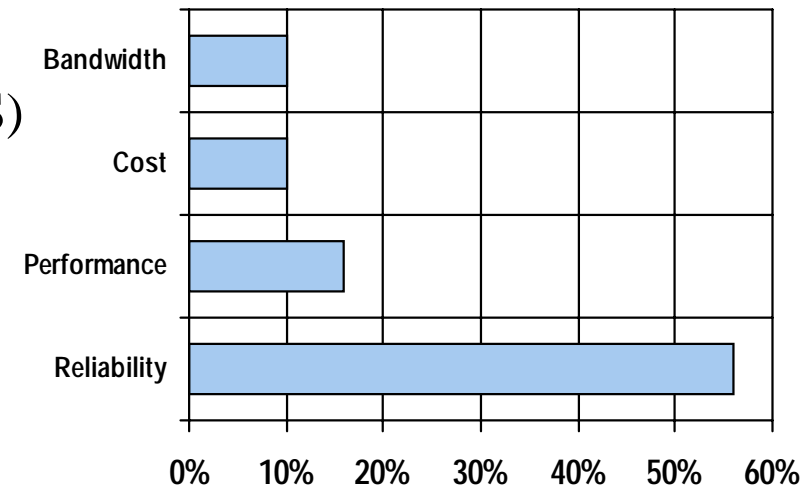
- **What?**
  - Piggybacking voice traffic on to data traffic and bypassing these high-tariff regulated networks.
- **Why?**
  - Cost Benefits
  - Single Network
- **When?**



# Driving Factors in VoIP Applications

- **Reliability**
  - High availability
- **Performance**
  - Voice quality (QoS)
  - Density
  - Interoperability
    - Signaling
    - Backward compatibility
    - Migration path
- **Price/performance (cost/port)**
- **Bandwidth usage**

## Concerns About Running Voice Over Data Network



Source: Forrester Research, July 1998

## What Impacts QoS?

- **Quality of Voice Compression**
- **Echo Canceller**
- **System Delay**
  - Jitter buffer
  - Bad frame masking
  - Processing delay
- **Network Delay**
  - Controlled by ISP/CO

# Open Standards

- **CompactPCI**
- **H.110 Telephony Bus**
- **RTOS**
- **Algorithms**
  - ITU-T
  - **DAIS**
- **Call Control Protocols**
  - IETF/TIPHON/ITU-T
    - MEGACO
    - H.323
    - SIGTRAN
- **Software Framework**
  - DSPBios (Planned Activity)

## What is DAIS?

- **DSP Application Interoperability Standard from TI**
- **DAIS algorithms are easy to integrate in any application**
- **Clean performance characterization**
- **Defines the memory requirements of the algorithm**
- **Common API's -- easy to plug in**

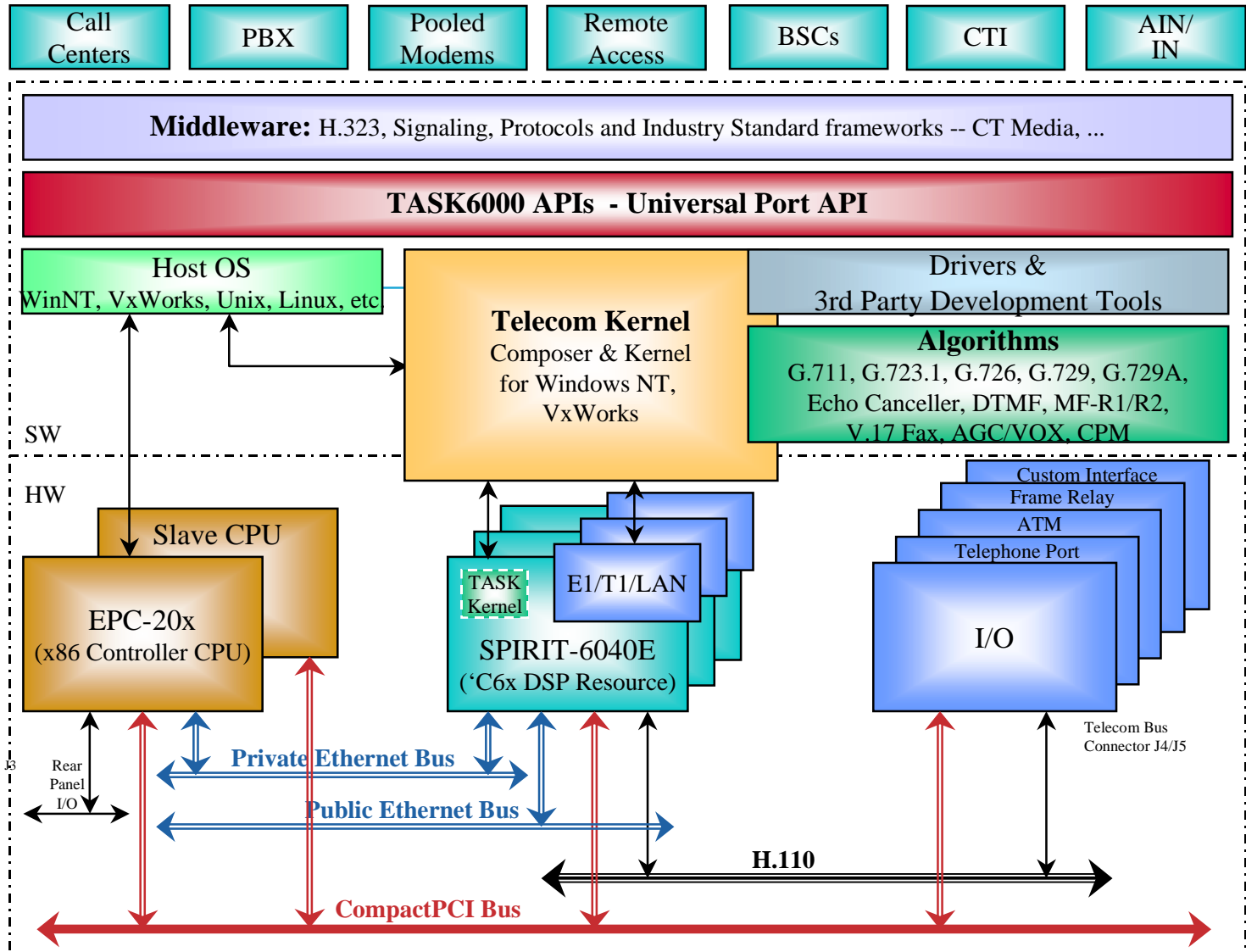
## How Is RadiSys Embracing DAIS?

- **14 voice coders have successfully passed DAIS test !**
- **Working under TI's big umbrella -- eXpressDSP™ Technology**
- **APIs**
  - **G729ENC\_encode(handle, pInBuf, pOutBuf)**
  - **G729DEC\_decode(handle, pInBuf, pOutBuf)**
  - **G723ENC\_encode(handle, pInBuf, pOutBuf)**



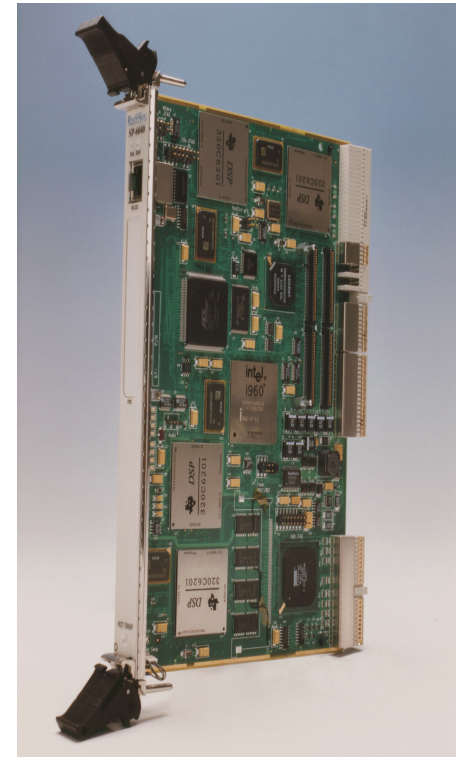
# TDM-IP Media Processing Architecture

RadiSys Building Blocks

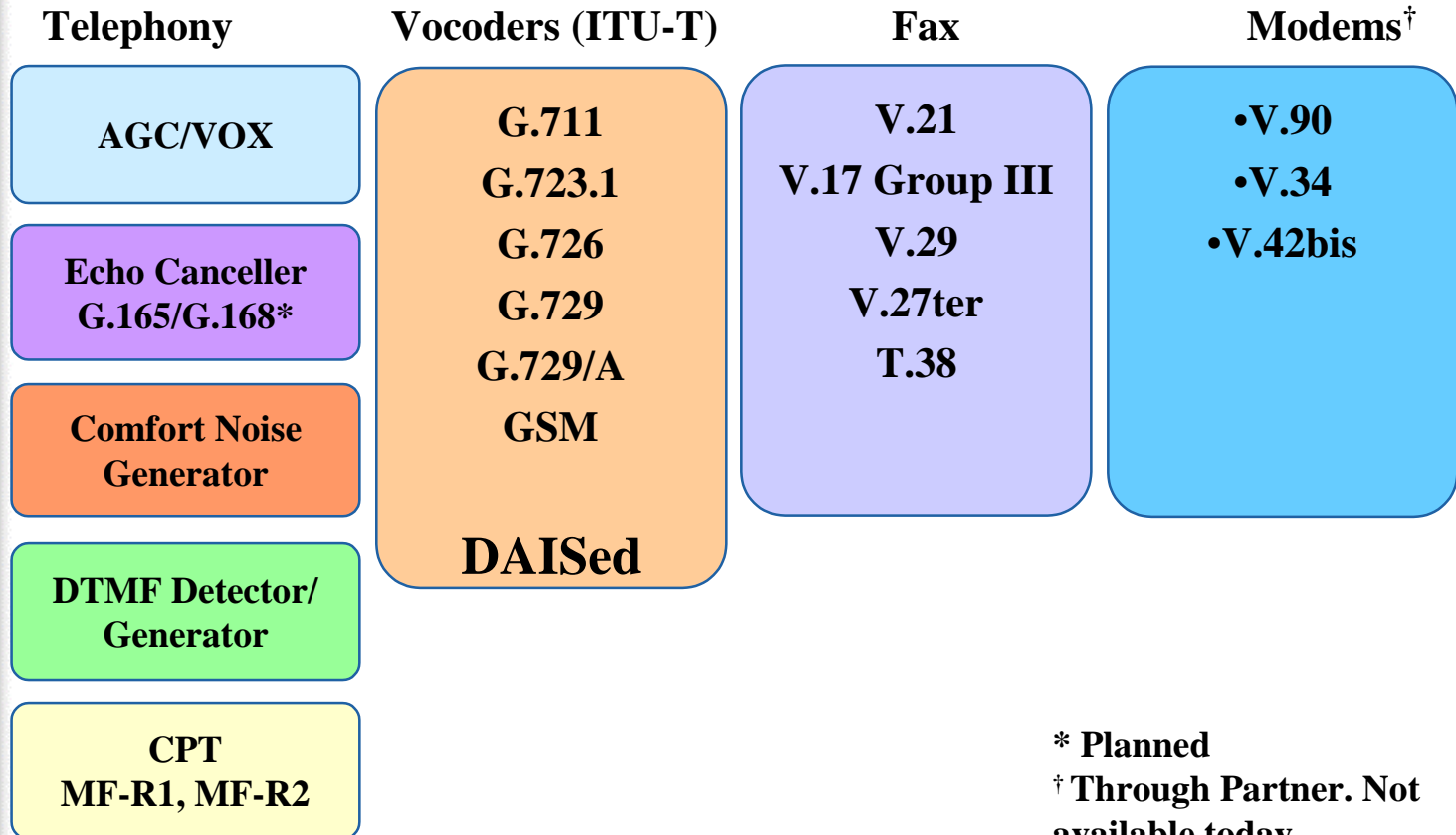


# SPIRIT Family

- **SPIRIT6020-PCI**
  - Two C6201 DSPs @ 200MHz ea.
  - i960RD as IOP
  - Targeted for Call Center/IVR/CTI applications
- **SPIRIT-6040E**
  - Four C6201 DSPs
  - i960RD as IOP
  - Up to 48 ch. Of VoIP
  - Dual 10/100BaseT
  - Up to Quad E1/T1 via PMC



## Middleware and Protocol Stacks (under development)



\* Planned

† Through Partner. Not available today

Telecom Application Specific Kernel (with host API)  
UniversalPort, DSP resource management, QoS management

# Telecom Application Specific Kernel (TASK 2.0)

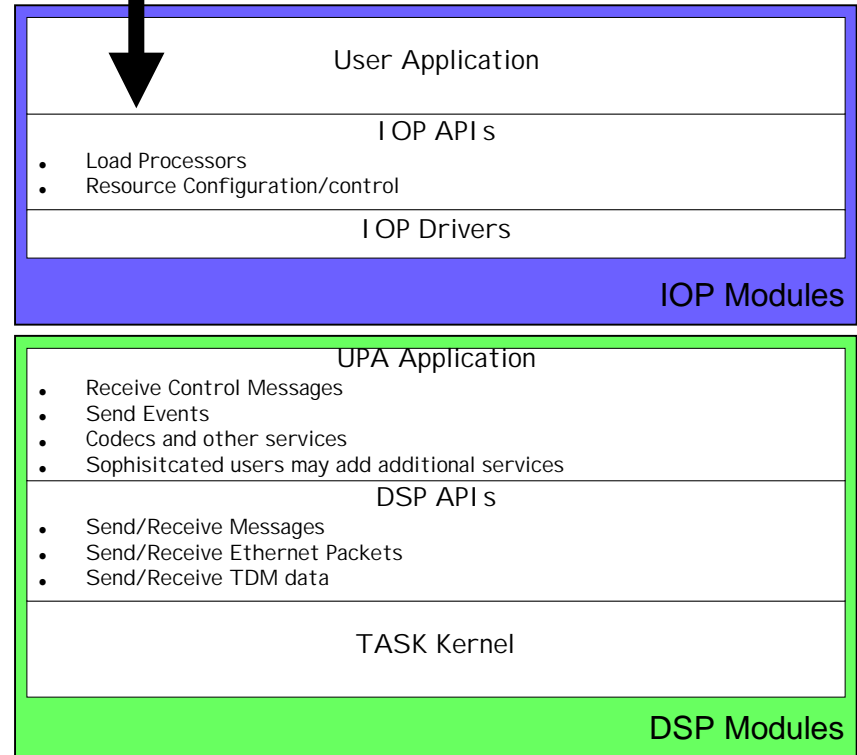
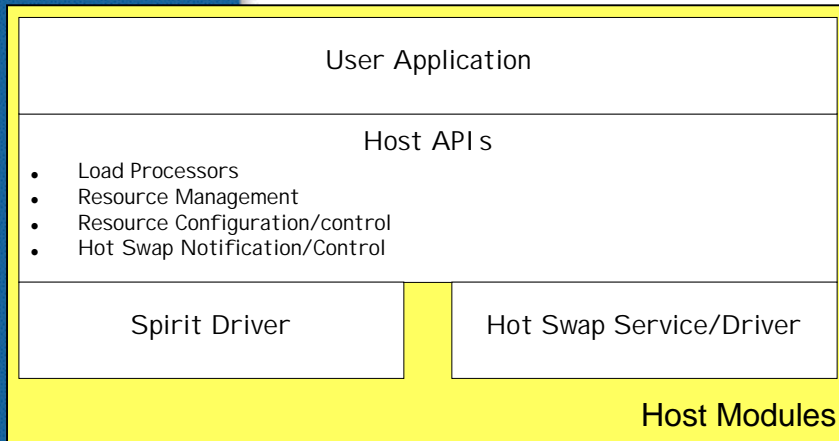
- **Application composer and a Real-time Telecom Kernel for 'C6x DSP**
- **Supports dynamic channel switching**
- **Universal Port API**
  - Flexible development environment for V/FoIP applications
  - No DSP and low level programming
  - Runs under VxWorks O.S
- **Resource Manager**
  - Host based API for management of all SPIRIT devices
  - Request a resource based on type and capabilities
  - Allocate a particular resource and register the capabilities which will be in use
  - Reallocate a resource with a different set of capabilities, which the RM will track
  - Free a resource
  - Display resource usage (version 3.0)

# TASK 2.0 Architecture

40% free  
for user  
Apps.

Host CPU

IOP/DSP



# Application Ready Platform

## Processing Engines

- DSP resources
- CPUs -- Master and Slave
- I/O (LAN/WAN)

## Algorithms

- Voice Coders
- Fax
- Telephony  
(AGC/VOX, CPM,  
CNG, DTMF)
- Echo Canceller

## Signaling

- MF R1/R2
- CAS/CCS



## Software

- BSP
- TASK 2.0

## Protocols

- H.323
- MEGACO
- SS-7

## Port/Develop Your Applications

- Trunking Gateways
- Signaling Gateways
- AIN/IN Services
- CTI/IVR
- and more...

## System

### Integration

- Chassis
- Backplane
- Power Supply

## Summary

- **Telecom is moving towards standardization**
- **RadiSys is working very closely with its partners, like Intel and TI, to make this happen**
- **DAISized all the voice coders**
  - Work on telephony algorithms in progress
- **RadiSys can provide an Application Ready Platform for VoIP/SS7 applications**