# A104 QUAD T1/E1 AFT card

The A104 is an updated, quad port version of Sangoma's range of Advanced, Flexible Telecommunications (AFT) hardware designed for optimum support of voice and data over T1, E1 and J1.

Based on bus mastering PCI technology supported by a ring-buffer DMA architecture, the A104 provides full speed 132 Mbps PCI bus transfer with minimal real-time processor load. This provides optimal performance in demanding environments such as soft PBX/IVR voice applications.

Operational modes

Voice modes:
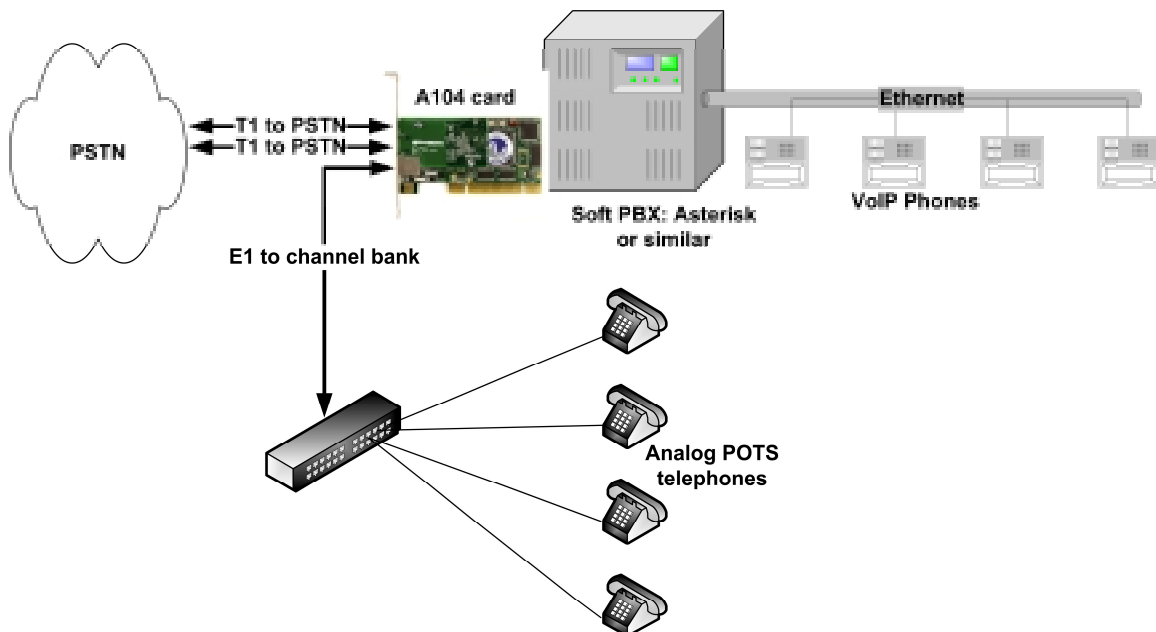
- The A104 and drivers fully support TDM voice gateways for the **Asterisk™** PBX project, as well as other Open Source and proprietary PBX/Switch/IVR applications.

- Supports Robbed Bit Channel Associated Signaling (CAS) and ISDN PRI.
- Block mode raw bit-stream interface for integration with the Asterisk Open Source PBX/IVR platform.
- Channelized mode supporting individual DMA into voice timeslots plus on-board HDLC support of PRI channel for soft PBX implementations that can use these features.
- Field upgradeable hardware allows for new TDM-related functions to be added as they become available.
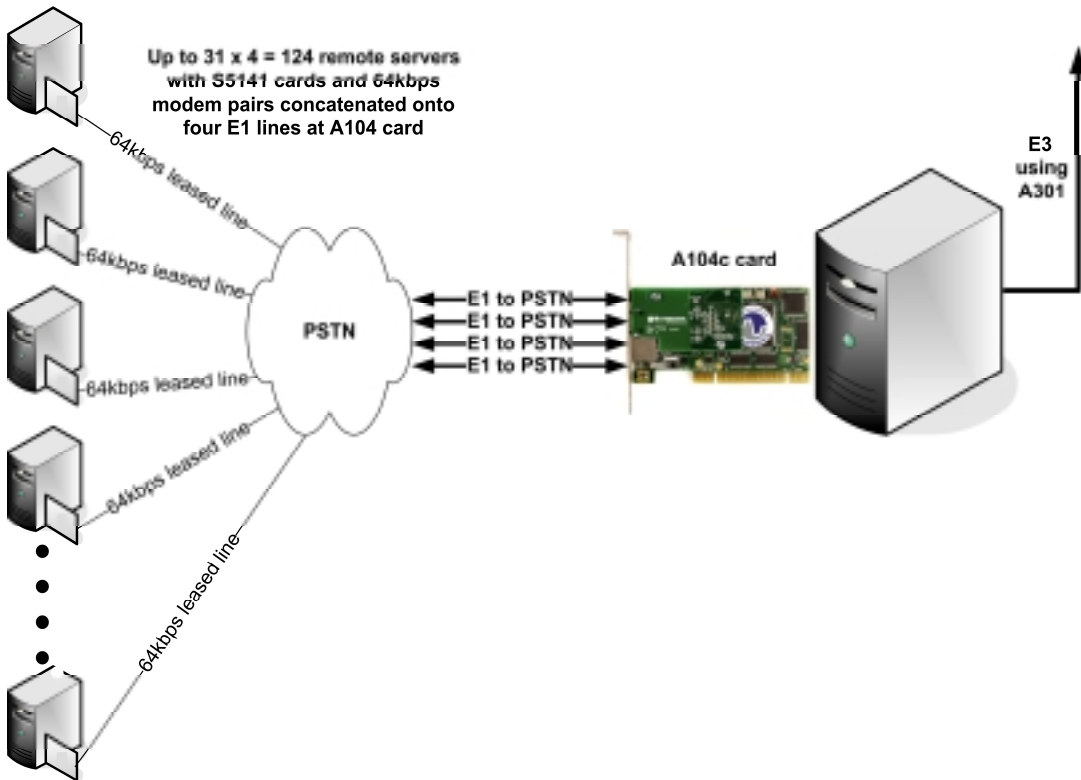
Data only:
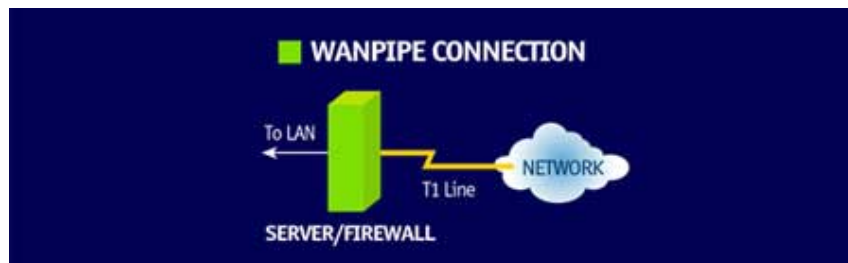
To Replace
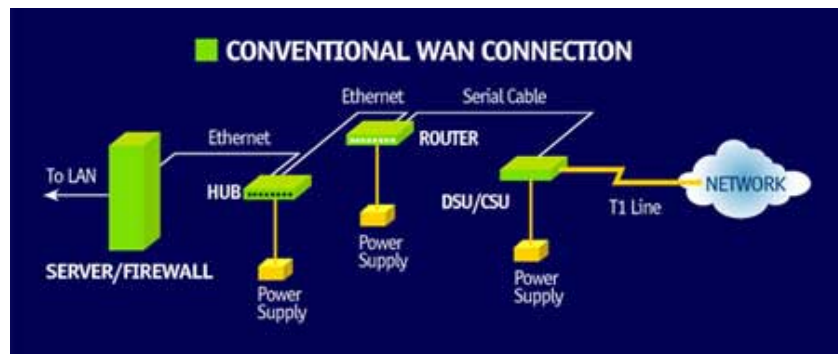
- T1/E1 and fractional T1/E1, single channel HDLC per line.

- Full channelized mode to act as major network hub for sub-DS1 remotes. The A104c can support any configuration of up to 124 remote 64kbps connections carrying Frame Relay, PPP or HDLC data. Timeslots can be concatenated to support remote fractional T1/E1/J1 sites in any combination.

- Raw bitstream interfaces can be used to support arbitrary non-standard line protocols such as non-byte aligned monosynch or bisynch.

Mixed Voice/Data mode:
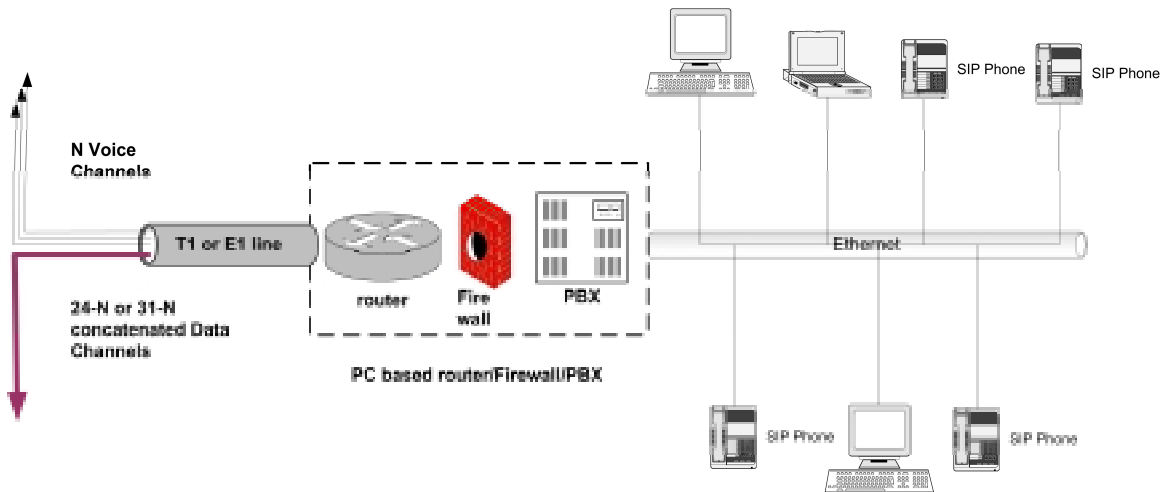
- Robust combination of router/PBX functions in one server.
- WAN data connection is supported by Sangoma's standard **WANPIPE**®
  routing stack , completely independently of TDM voice application for total
  system reliability.
- **WANPIPE**® supports certified, field tested and reliable Frame Relay, PPP,
  HDLC and X.25.

Technical Specifications

- Quad port T1/E1/J1 card.
- Dimensions: 2U Form factor: 120mm x 55 mm for use in restricted chassis.
- 32 bit bus master DMA data exchanges across PCI interface at
  132Mbytes/sec for minimum host processor intervention.
- Ring buffer DMA handling for minimum host intervention and guaranteed data
  integrity on high volume systems.
- Intelligent hardware: Downloadable Field Programmable Gate Array
  programming with multiple operating modes. Allows new features related to
  voice and/or data to be added when they become available.
- Power: 800mA peak, operational 300mA max at +3.3v or 5v.
- MTBF: > 1 Million hours.
- Autosense compatibility with 5v and 3.3v PCI busses.
- Temperature range: 0 – 50C.
- Line decoding: HDB3, AMI, B8ZS.
- Framing: CRC4, non-CRC4, ESF, D4T1/E1.
- Clocking mode: Normal, Master.

RJ 45 Pin-out

RJ45 E1/T1 pinouts	
Pin	Signal
1	RTIP
2	RRING
4	TTIP
5	TRING

Operating systems

Linux (all versions, releases and
distributions from 1.0 up). Windows,
FreeBSD, Open BSD, NetBSD to
follow shortly.

T1/E1 Status alarms

- ALOSV: Loss of Signal alarm
- LOS: Receive Loss of Signal
- ALTLOS: Alternate loss of Signal Status
- OOF: Out of Frame
- RED: Telco Red Alarm condition
- AIS: Alarm Indication Signal
- OOSMFV: Loss of Signaling Multiframe
- OOCMFV: Loss of CRC Multiframe
- OOOFV: Out of Off-Line Frame
- RAIV: Receive Loss of Signal
- YEL: Receive Telco Yellow Alarm

Line protocols

Voice CAS and PRI, ATM, Frame Relay, X.25, HDLC, PPP, SS7, Transparent bit-stream, BSC.

Certification

FCC Part 15 Class A, FCC Part 68, CE.

Higher level protocols

Asterisk Open PBX/IVR, IP/IPX over Frame Relay/ PPP/ HDLC/ X.25, X.25 over Frame Relay (Annex G), BSC over X.25 (DMT and TCOP), SNA over X.25, PPPoE, PPPoA, IP over ATM.

Diagnostic Tools

WANPIPEMON, SNMP, System logs.

Production quality

ISO 9002

Warranty

Three years parts and labour.

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