Presentation de Transition Networks

- Media Conversion
- Switching
- Power-over-Ethernet
- Industrial Ethernet
- IP Video

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Programme

- Presentation de Transition Networks
- Historique
- Nos marchés
- Les solutions Transition Networks
- Clients EMEA Transition
- Presentation du catalogue TELCO de Transition (Gary)
- Presentation des produits ISDN/ TDM sur IP (Pete)
Transition Networks

- Fondee en 1987
- Siege social a Minneapolis, MN
- Societe cote au NASDAQ: JCS
- 35% de croissance en 2010-2011
- En mode croissance depuis
- Presence mondiale
- Soutien actif au MEF, IEEE, ITU & IETF
- Support 24/7/365
- Un des Leader du marché Carrier Ethernet
  - 2007 – 1er NIDs (EFM-802.3ah) lance
  - aujourd’hui 6 familles de produits NID disponibles
    • EFM/CFM/Y.1731

100 000 NID deployes dans le monde
Historique de Transition

1987
Transition Engineering Founded

1995
Renamed to Transition Networks

1998
CSI Purchased LANart & Merged with Transition

1999
Transition Networks Purchased by CSI Inc.

1999
Lifetime Warranty Introduced

2002
MILAN Acquisition

2005
Transition Networks & MILAN merge to form one company with two industry leading brands.

2007
Record sales year for Transition Networks

2010
EMEA Warehouse and Repair Facility Opens

2011
Patapsco Acquisition by Transition Networks

1988
Patapsco Founded

1990
IMUX product launched

1993
Non blocking TDM switch with Imux launched

1995
Backup products launched

2001
Liberator products launched

2005
Circuit emulation products

2007
ISDN circuit emulation

2007
Released ION platform

2007
Opened office in Shanghai, China

2002
MILAN Acquisition

2011
Patapsco

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Nos marches

- **INDUSTRIEL**
  - Energie
  - Production
  - Transport

- **OPERATEUR**
  - Telco
  - FAI
  - Mobile

- **MARCHE PUBLIC**
  - Defense
  - Collectivite
  - Education

- **SECURITE**

- **ENTREPRISE**
Les Solutions de Transition

• Conversion de Media
• Carrier Ethernet
• Interconnection Mobile
• Multiplexage / Demultiplexage
• CWDM
• Video Surveillance
• Patapsco ISDN / TDM solutions
Quelques clients EMEA

- BMW
- Munich Airport
- Stockholm Airport
- Oslo Airport
- Prague Airport
- Bratislava Airport
- Mercedes Benz
- Serbia Electrical Industry
- Hungarian Telecom
- Croatia Telecom
- British Telecom
- Dutch Railways
- Spanish Railways
- UK Foreign Office
- UK Prime Minister’s Office
- Croatian Army
- UK Ministry of Defence
- NATO
- GTS Telecom Romania
- Czech Railways
- Prague Metro
- Volvo
- Belgrade City (Gazela Bridge)
- Thales
- Sanef Telecom

- Gazprom
- Dubai Airport
- Lufthansa Technik
- TDC (FTTH) Denmark
- Kruger National Park
- ABB South Africa
- Marikana Platinum Mine
- Bulgaria Telecom
- Nokia Austria
- Hewlett Packard UK
- Dell Computers Ireland
- Saudi National Oil Company
- T2 Slovenia (FTTH)
- Telcom South Africa
- Durban Electricity
- ABB Power Systems
- Port of Cape Town
- Pretoria Council
- Botswana Defence Force
- Zimbabwe Telecom
- Pretoria Transit
- Institute of High Energy Physics (Moscow)
- Telia/Sonera AB (Denmark)
- Air France
- Port of Felixtowe
- Barcelona City Council

- Marks & Spencer
- Homebase
- Cullinan Diamond Mine
- T - Com
- Madrid City Council
- Electro Ljubljana
- Telecom Slovenija
- Metro Group
- Bertelsmann Verlag
- Bayerischer rundfunk
- Swedish Navy
- South African Ports
- Danish Telecom
- Ericsson AB
- Skanska AB
- Electrolux AB
- Hubtelecom France
- Citévision
- Vattenfall
- Telenor
- Statoil
- Telia/Sonera AB (Sweden)
- New Doha Intl Airport
- Saint Gobain
- Royal Air Maroc
- Meditel
Certifications

- UL (Underwriters Laboratory) = electrical safety
- CE (Conformité Européene) = electrical safety
- ISO 14001 = Environmental management system
- ISO 9001 = Quality
- ROHS = Restriction of Hazardous Substances
- WEEE = Waste Electrical and Electronic Equipment
- NEBS = (Network Equipment Building System) = interference
- CISPER (Comité International Spécial des Perturbations Radioélectriques) = interference
- MEF (Metro Ethernet Forum) = Carrier Ethernet
- Svyaz and GOST (Gosudarstvennyy Standart) = Russian / CIS Standards
- GL (Germanischer Lloyd) = Marine Industrial
- UL CLASS1/DIV2 (ATEX) Hazardous Environments
Le catalogue TRANSITION

Presente par:

Gary Fieldhouse
Business Development Manager TELCO
Conversion

Largest copper to fiber media conversion selection

**Globally**

Broad spectrum of supported network protocols:

- Ethernet, Fast Ethernet, Gigabit Ethernet, T1/E1, DS3, ATM, RS232/485, video, power-over-Ethernet, industrial, and more

Available in chassis, stand-alone and PCI form factors

SNMP manageable and can be managed through:

- Our Focal Point graphical interface
- Web browser
- Command line interface

Lifetime Warranty

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Connect office environment to:
   - Extended temperature environments
   - Factory floor
   - Substation

Eliminate EMI concerns with fiber cable
Extend the life of copper equipment
SNMP management

Portfolio includes:
   - Industrial switching and media conversion
   - Industrial PoE switching
   - Industrial device servers
   - Substation switches
   - Extended temperature media conversion and switching

Lifetime Warranty
Industrial Mini

10/100Base-TX to 100Base-FX Media Converter
-40 to +75 C operating temperature range
+12 – 48 VDC / 24 VAC power
Terminal block DC power supply connection
Barrel connector option included
SC, ST or LC, MM or SM Fixed optic
DIN rail mounting bracket included
Optional Wall-mount bracket available
Tiny Mechanical Size
Lifetime Warranty
Industrial Power – small scale

25080
- Provides 120 Watts
- 48VDC @ 2.5A output
- Universal AC input
- Now available in a Slimmer form-factor, 25105

25083
- 12VDC @ 2A output
- Universal AC input

25104
- New, 240 Watt
- 48VDC @ 5A output
- Universal AC input
Extended temperature SFP


Cisco Compatible

-40 to +85 C operating temperature range

Key part of solution for bringing Ethernet switching and Media Conversion into industrial environments
INDURA™ – What’s New

IND-3280-L and IND-3284-L
Available for samples and demos
Production quantities

Initial customer interest
Demo units sent
Conference calls with Applications Engineers
INDURA™ – Certifications

Indura™ is “designed to” these standards and is in the process of getting “lab-certified” to these standards

Certification schedule for the IND-3280-L & IND-3284-L

• **IEC 61850-3** for Electrical Substation environments
  - EMC portion is complete
  - Environmental portion is in progress

• **EN 60079**

• **UL 1604 Class 1 Div 2** for Hazardous Locations

• **IEEE1613**

• **ATEX Zone 2 and UL 60950**
INDURA™ – High Voltage option

IND-3280-H and IND-3284-H

– 125 VDC power input option
– Early prototypes for a few customers
  • Available early August
– 50 – 100 units - certifications pending
  • Available Late August
– General production quantities with all certifications
  • Available Late November
DAC-10G-SFP-0xM

Direct Attached 10G SFP+ Copper Cable Assemblies
DAC-10G-SFP-0xM

• Direct Attached Copper Cable Assemblies
  – Twin-axial shielded cable
  – SFP modules permanently attached
  – No optics, all electronic

• Designed for 10Gig Networks
  – Supports data transfer rates from 1 Gig up to 10 Gig

• Ideal for high speed, short distance, interconnects
  – Enterprise networking
  – Storage area networks
  – Service provider customer hand-off points

• Nice accessory for xTGFF4848-100
APPLICATION

• Protocol independent
  – Ethernet 1G and 10G
  – Fiber Channel 8G and 10G
  – FCoE 10G
  – InfiniBand SDR, DDR, and QDR

• Application
  – Inner-rack connections, up to 7 meters
  – Significant cost saving compared to optical alternatives
Carrier Ethernet

Carrier Class Ethernet application delivery
– NID’s, Switches, Fibre aggregation and media conversion
S3280 – MEF 2.0 ‘ready’

E-Line (EPL,EVPL)
- Ethernet Private Line
- Ethernet Virtual Private
- Ethernet Internet Access

E-LAN
- Multi-Point L2 VLANs
- Transparent LAN Service
- Multicast Networks

E-TREE (Future support on S3280)
- Rooted Multi-point L2 VLANs
- Broadcast networks
- Traffic Separation
- EP-Tree, EVP-Tree
S3280 NID

Configuration delivery
- 4 100/1000 SFP ports
- 4 10/100/1000BASE-T ports
- Any port can be network or client

Perfect for Mobile Backhaul and CE

High Level Feature Overview
- SNMP v1, v2c & v3
- IPv6
- VLAN with Q-in-Q
- Bandwidth allocation
  - Per EVC / VLAN
- QoS
- 802.3ah, 802.1ag, Y.1731
- Ring protection
  - G.8031 and G.8032
- 1588v2
- Last gasp notification
- CE 2.0 ready
Mobile Backhaul

MEF switches, NID’s, Standalone and Chassis based systems
Multiplexing

TDM Multiplexing

– Cost effectively deploy E1 / T1, 4 x E1 / T1 and E3 / T3 / DS3
CWDM

Increase bandwidth on infrastructure, alleviates fibre exhaustion
Video Surveillance

Deliver PoE and PoE+ to traffic control systems and security cameras
Aggregate connections and backhaul using Copper of Fibre
Carrier Grade Fibre Access Solutions

Complete line of fiber access products including:
- MEF 9, 14 and 21 compliant 802.3ah Ethernet NIDs
- Traditional TDM NIDs (4xT1/E1, T1/E1, DS3-T3/E3, ATM, POTs, etc.)
- Fiber Conserving CWDM
- 802.3ah OAM Switches

Features Include:
- Metro Ethernet Forum certification
- OAM remote management
- Integrated IP Management
- Support for Service Level Agreements (SLAs)
- QoS and VLANs
- Bandwidth allocation
- Port statistics
- Fiber conservation

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Switching

Wide range of Ethernet switches
  - Unmanaged
  - Managed
  - PoE
  - 802.3ah OAM

Customization and modifications to meet customer needs
  - Unique and specific configurations
  - Small port count
  - Default software settings
  - Specialty switches and optics
  - Unique, niche port combinations

Free Technical Support

Metal enclosures

Internal power supplies on majority of switches
TDM / ISDN over IP

Time sensitive application delivery across PSN’s, CESoIP (Circuit Emulation), SAToIP (Structure Agnostic TDM), unique clock recovery
PacketBand Multicast Application

Shows multiple E1’s connected across a PSN with clock recovery at each point managed by the PacketBand.
ISDN over IP
MediaBand conversion

Transports up to 32 E1 / T1 circuits

— Support for multiple different clocks across fibre
— Same fibre can be used to simultaneously transport Ethernet services to site
Patapsco Designs:

- Established for over 23 years
- Office located in the south of the United Kingdom
- Acquired by Transition Networks in August 2011
- Wide expertise
  - ISDN for 19 years
  - TDM for 23 years
  - IP for 11 years
- Integration of both reputable product ranges
What does it do?
Delivers synchronous TDM circuits across various types of asynchronous, unclocked, next generation packet-based networks

Why?
– Using packet-based networks is more cost-effective than using traditional TDM PDH/SDH networks and leased-lines
– Replacing existing synchronous SDH equipment with packet-based equipment is very costly
– Using PacketBand allows the existing legacy equipment to be kept, while moving the applications to a packet-based network for the cost-saving and manageability benefits
Packet-based Network Traffic

- Ethernet/IP is asynchronous and has no concept of “clocks”, timing or ensuring both ends of a link are synchronised together
- Packets can be slowed down, queued, and resent if necessary

TDM Traffic

- Most T1/E1 applications are synchronous
- Timing information encoded into the data traffic
- Data clocked in and out on clock pulse edges
- Real time applications unable to be slowed down or traffic resent
- Data MUST be sent “on-time” or errors will occur!
Why is this technology needed?

• We need to transport T1/E1 synchronous data across an asynchronous packet network
• We need to recover clocks and provide clocks to the E1/T1 (V.35/X.21) interfaces
• All of these clocks need to be accurately aligned, otherwise:
  – Clock slips
  – Data loss (errors)
  – Interface shut-down
  – Suppliers won’t meet Service Level Agreements
Applications

Typical PacketBand Applications
Star Networks

- These networks involve a “one-to-many” layout
- A master site has multiple links out to remote sites where there are remote PacketBand units
- Master clock at central site
- Slaves recover clock
Mesh Networks

Mesh networks can be thought of as multiple Star networks with links between each Star.

- Clocking is much harder to configure. There are multiple “Master” sites – where do we put the reference clock, and how do we make sure it goes to all of the devices in the system?
Mesh Networks

- With no clear way to distribute a clock around the system, we had to look at using other methods
- We developed a Multicast clocking system, which allows a clock to be distributed around the system separately to the data using IGMP
- As well as three E1/T1 data connections, Multicast PacketBand units take a reference clock and send it to the other PacketBands using Multicast
- This clock distribution system can be replicated around the network in different regions where a clock source is available and distribute that clock to all of the units in that locality
Mesh Networks

- Provides centralised clocks just like the replaced legacy system
- Means one clock source
- Standard Multicast IGMP protocol
- Separate to the data and separately prioritisable
- Local Multicast TX units means fewer hops between devices = excellent clock recovery
- Backup clock source configurable
- Easy to configure
- Unique to this product
A look at the hardware...
PacketBand TDM – Summary

Hardware Versions

• Single port E1/T1
  – Single E1/T1 Port
  – Two copper 10/100
  – One SFP

• Single port V.35/X.21
  – Single serial interface
  – Two copper 10/100
  – One SFP

• Quad port E1/T1 (1)
  – Quad G.703/G.704
  – Two copper 10/100
  – One SFP
  – Separate clocks per E1

• Quad port unit (2)
  – 4 x Ethernet
  – 2 x SFP
  – Optional 5th PoE port
PacketBand TDM – Summary

Hardware Versions
- Quad port Extended Temperature
  - 4 x Ethernet ports
  - 2 x SFP
  - Optional 5th PoE port
  - -33VDC to -75VDC PSU option
  - -9VDC to -36VDC option
  - Dual fans

- Chassis
  - 2U high 19” rack mountable
  - Dual hot-swappable load-sharing AC/DC PSUs
  - 8, 16 or 32 TDM ports or...
  - 8, 16 or 32 X.21/V.35 ports... or a mix
  - 2 copper Ethernet
  - 2 SFPs
  - External clock ports

All units can inter-work, and the configuration options between them are almost identical
Proof of Concept Testing

- Proving the quality of PacketBand’s clock recovery systems to potential customers is sometimes necessary.
- We can advise on what to test and how to go about it based on the customer’s application.
- We can visit the customer to configure the test and make sure it runs as planned.
PacketBand ISDN

On to PacketBand ISDN
PacketBand ISDN

What does it do?
• Delivers dynamically switched ISDN circuits across packet-based networks

Why?
• Mostly for the same reasons as PacketBand TDM
• PacketBand ISDN is also often used to solve logistical problems, e.g. distributing video conferencing systems around a building

What is the difference?
• PacketBand ISDN’s dynamic switching and routing of ISDN traffic makes it a full emulation of the ISDN network, but over a packet-based network
• Bandwidth is used on-demand, rather than having “nailed”, always-on services
• Call signalling handled natively by PacketBand’s on-board ISDN stack
• Supports 4 and 2-wire BRI as well as PRI services
ISDN Technology

Integrated Services Digital Network

• Synchronous
• Digital connection to the PSTN
• Not Analogue/POTS!
• Supports both voice and data
• Switched 64kbps Digital network (1 phone call/data channel)
ISDN Technology

Integrated Services Digital Network

• 2 Delivery methods – BRI & PRI
  – BRI = 2 x 64k Data (B) Channels + 1 x 16k Signalling (D) Channel
  – E1 PRI = 30 x 64k Data (B) Channels + 1 x Signalling (D) Channel (T/S 16)
PacketBand ISDN – Hardware

Hardware Versions

• Chassis
  – 2U high 19” rack mountable
  – Dual hot-swappable load-sharing AC/DC PSUs
  – 8, 16 or 32 PRI ports
  – 2 copper Ethernet
  – 2 SFPs
  – 4 x External clock ports

All units can inter-work, and the configuration options between them are almost identical
PacketBand ISDN – Hardware

Hardware Versions

• Single port BRI
  – Single BRI Port (S interface)
  – Two copper 10/100

• Quad port BRI/Single PRI
  – Quad BRI Port (S or U interface)
  – 1 PRI port
  – Two copper 10/100/1000
  – One SFP

• Quad port PRI
  – Quad PRI Port
  – Four copper 10/100
PacketBand ISDN

Sounds a bit like VoIP...

- VoIP is designed for voice traffic, and so many ISDN applications don’t work
- Most VoIP systems use compression – OK for voice traffic but not for data applications
- No synchronisation – some apps simply won’t work
- Some VoIP systems offer poor quality
- Does not offer full ISDN, so additional services such as REROUTE, Deflection etc are not supported. Can be an issue for carriers trying to replace existing ISDN services

- PacketBand is full ISDN, so carriers don’t need to worry about whether the customer’s application is compatible
Switching, Routing and Conversion

- The core of the technology is the same as the PacketBand TDM
- The Jitter Buffer, Frames per Packet, Clock Recovery options etc. are the same on PacketBand ISDN
- The key difference is that calls are handled dynamically and individually
- Calls are routed using a table of Routing Profiles
PacketBand ISDN

Switching, Routing and Conversion

- This diagram shows a SIP Server, which can optionally be used to handle the D Channel call routing
  - Moves Call Routing to central location
  - Two SIP servers can be configured for backup
  - Simplifies configuration and manageability of the system
PacketBand ISDN Applications

- Tend to be straightforward point-to-point applications, or distribution of ISDN around a site
- In this diagram, the customer has an ISDN PRI which is being shared between a PABX and two videoconferencing systems
- The PRI PacketBand will typically route all calls to the PABX unless they match configured number ranges for each of the videoconferencing units
- Calls from any of the devices are routed out to the ISDN PRI connection
- There is also the option to route calls internally between the two videoconferencing systems
PacketBand ISDN Applications

- Distributing ISDN around a number of buildings or a large building with multiple floors using their LAN
- Solves problems with BRI cabling distances
  - Some VC manufacturers list maximum BRI distance as 60m!
- One cable to link into the network rather than 3 BRI cables
- Easy to move VC between floors/rooms
PacketBand ISDN Applications

- Carrier applications providing ISDN to customers
- Multiple delivery methods depending on network and customer needs
Key points of PacketBand ISDN

- Full, clock-locked, switched ISDN functionality
  - Voice
  - Data
  - Video
  - Supplementary Services
  - Encrypted data
- All traffic supported; no need to worry about ISDN applications not working
- Expansive support for ISDN protocol types, routing and conversion options
- Expertise in ISDN – 22 years plus of experience!
- SIP Server options
- Intuitive, easy to use GUI
DbManager Introduction

DbManager

- Windows-based Intuitive GUI for managing and configuring product range
- Works on all Windows operating systems

- Scaleable to support networks of any size
- “Tree Branch” network map
- Sophisticated yet user friendly
- Manages all TN Patapsco products
- Multi-User Network stations
- Embedded SNMP Proxy Agent “Traps and Alarms”
- Data export for performance analysis
Other Products

DataBand
- Multiplexes timeslots from any port to any other
- E1-T1 Conversion
- A-Law to μ-Law conversion
- Fixed E1/T1 circuits rather than switched connections (Liberator)

Liberator
- Range of ISDN converters/switches
- Full timeslot switching between PRI and BRI
- Stand-alone
- Versatile solution to any ISDN-based problem

MediaBand
- E1, T1, V.35 and X.21 to fibre
- Single and multi-ports
- Up to 32 x E1/T1/X.21/V.35
- Also transports Ethernet
Learn more about Transition

- Website
- 2012 Product Catalog
- Free, Live web-based weekly trainings
Merci pour votre attention

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