TMG7800 VoIP Gateway
512 to 32,768 channels per cluster
Up to 4 clusters for 131,072 channels

The TelcoBridges *T*media TMG7800 is our high density carrier-grade VoIP gateway and is defined by the highest scalability in the entire *T*media family.

Our scalable building blocks approach offers carriers a VoIP gateway from 16 to 1024 T1/E1, or 1 to 48 DS3 or 1 to 16 OC3/STM-1 per cluster. Up to 4 clusters can be controlled within a single system. The TMG7800 also provides high availability and redundancy, which is a requirement for carrier-grade networks.

Product Characteristics:

- ✓ 3U to 22U VoIP single gateway system per cluster
- ✓ 512 to 32,768 VoIP channels per cluster
- ✓ 16 to 1024 T1/E1 or 1 to 48 DS3, or 1 to 16 OC3/STM-1 per cluster
- ✓ Up to 4 clusters within a single system
- ✓ Support mix of multiple TDM interface types
- ✓ Non-blocking routing from/to any ports (TDM or VoIP)
- ✓ Non-blocking low delay TDM switching fabric within a cluster
- ✓ Non-blocking packet switching fabric inter-clusters
- ✓ SIP, SIGTRAN, SS7 ISUP, ISDN PRI, E1 CAS R2, T1 CAS R1, H.248
- ✓ Redundant AC or DC power supplies
- ✓ Optional *T*media 1+1 and N+1 groups
- ✓ Up to 2,700,000 BHCC

*T*media 1+1 and +1 Protection Characteristics:

- ✓ Enables full facility protection (TDM and IP)
- ✓ No single point of failure
- ✓ Five nine's redundancy

*T*media™ TMG7800 Data Sheet

TelcoBridges TMG7800 is a highly scalable telecom solution growing from a few hundred channels to tens of thousands channels without expensive entry costs. You can grow your TMG7800 system according to your business' needs:

From

PulseSupply

- Mix any types of TDM interfaces in a single system
- Manage multiple 1+1 or N+1 redundancy groups
- Add new units to grow your live system without impacting actual traffic
- Single system to manage

Pulse Supply
410-583-1701
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www.pulsesupply

TMG7800 System

<u>TMG7800 solution components</u>
2 TMG7800-CTRL controlling one to four clusters
1 to 16 TMG7800 telecom units (T1/E1, DS3, OC3/STM-1) per cluster
2 TMG7800-TMS (optional) per cluster
Up to 4 clusters
TMG7800-N+1 patch panel(s) (optional)
TMG7800-1+1 patch panel(s) (optional)

<u>TMG7800-CTRL</u>
Manages all components in the system
Performs call control on all components
Supports active/standby redundancy

<u>TMG7800 telecom unit</u>
Runs signaling stacks
Provides TDM and VoIP network interfaces
Hardware accelerated media processing and transcoding
Each additional unit adds more capacity to the system

<u>TMG7800-TMS (optional)</u>
Non-blocking low-delay TDM universal media switched fabric across all telecom units
Manage and propagate the system TDM clock
Second TMG7800-TMS enables redundancy

<u>1+1 Patch Panel (optional)</u>
TDM facility protection group for two telecom units
Passive protection (no power required)

<u>N+1 Patch Panel (optional)</u>
TDM facility protection group for up to 15 telecom units

Capacity and Voice Processing

<u>PSTN interfaces</u>
16 to 1024 T1/E1 or
1 to 48 DS3 or
1 to 16 OC3/STM-1 with APS per cluster
Framing independently configurable per port
2 BITS interfaces on DS3/OC3/STM-1 units

<u>VoIP interfaces</u>
Up to 32 Ethernet ports 100/1000Base-T (2 per telecom unit) per cluster
RJ45 connectors on rear of unit
Up to 256 different IP addresses (16 per telecom unit) per cluster
Ethernet port bonding and 802.1q VLAN support

<u>Vocoding</u>
512 to 32,768 VoIP channels with universal codecs per clusters
Universal codecs: G.711, G.723.1, G.726, G.729ab, T.38 V.17, clear mode (RFC 4040)
Other codecs: G.722, G.722.2 (AMR-WB), G.728, G.729eg, iLBC, AMR, EVRC, GSM, FR/EFR, QCELP, T.38 V.34

<u>Fax/modem/data</u>
T.38 fax relay (V.17 and V.34)
Automatic G.711 fallback
Modem and data passthrough, NSE, VBD support
Clear mode (RFC 4040)

<u>DTMF relay</u>
RFC 2833/4733, SIP INFO method, in-band

<u>Echo cancellation</u>
G.168 echo cancellation
128 ms echo tail on all channels simultaneously

<u>Voice processing</u>
Adaptive and programmable jitter buffer (20 to 200 ms)
Voice activity detection (VAD)
Comfort noise generation (CNG)

<u>Voice recording and announcement playback</u>
Up to 2048 channels (using optional IVR mezzanine or specially licensed VoIP channels) per telecom unit

High Availability & Redundancy

IP port redundancy
Self-recovery software
Fault tolerant software
MTP2/SS7 links redundancy

Tmedia 1+1 solution (optional)
The Tmedia 1+1 solution extends the high-availability
    and redundancy features of the TMG7800

TMG7800 telecom unit redundancy
Full capacity protection (TDM and IP)
Configuration database redundancy
Seamless software upgrade
M3UA/MTP3/ISUP redundancy

Tmedia 1+1 solution consists of:
    1 active unit and 1 standby unit
    Up to 8 units 1+1 Patch Panel(s)

1+1 Patch Panels are passive (no power required)

Tmedia N+1 solution (optional)
The Tmedia N+1 solution extends the high-availability
    and redundancy features of the TMG7800

TMG7800 telecom unit redundancy
Full capacity protection (TDM and IP)
Configuration database redundancy
Seamless software upgrade
M3UA/MTP3/ISUP redundancy

Tmedia N+1 solution consists of:
    Up to 15 active unit(s) and 1 standby unit
    Supports multiple N+1 groups

Signaling

Simultaneously supports any combination or all of the
    following signaling protocols:

SIP

Supported RFCs: 2327, 2833, 2976, 3204, 3261, 3262,
    3263, 3264, 3311, 3323, 3325, 3326, 3372, 3389,
    3398, 3515, 3551, 3555, 3578, 3581, 3665, 3666,
    3764, 3891, 4028, 4694, 4733, 5806
SIP-I/SIP-T
Extensive SIP header manipulation

SS7

Up to 512 MTP2 links (56, 64, n x 56/64 kbps) or
    32 x HSL
Multiple redundant MTP2 links
Up to 64 originating point codes and 256 linksets
Up to 512 destination point codes
ISUP variants: ITU 92, ITU 97, ANSI 88, ANSI 92,
    ANSI 95, Q.767, Telcordia 97, ETSI v3, China,
    Singapore, UK, SPIROU, Japan NTT, Russia

SIGTRAN

M2PA, M2UA, M3UA (IPSP, ASP, SG), IUA
SCTP (raw IP and UDP)
SS7 termination and/or relay supported
Up to 512 M2UA / M2PA links
Up to 64 M3UA peer server processes

ISDN PRI

Q.931 ISDN PRI (user and network side)
ISDN variants: NI-2, 4ESS, 5ESS, DMS-100,
    DMS-250, Euro ISDN ETSI NET5 (France,
    Germany, UK, China, Hong Kong, Korea), Euro
    Numeris (VN6), NTT (Japan), Australia
ISDN NFAS with D-channel backup

CAS

MF R1 (including E&M, loop start, ground start)
MF R2 (including standard ITU, Brazil, Mexico,
    Venezuela)
Customizable script files to implement any CAS variant

*T*ctrl (Call Control)

Toolpack framework call control
Call routing based on: trunk group, calling/called numbers (with digit manipulation) and/or various other protocol information/headers.
Customizable routing including priority-based, load-balancing, black listing, call limiting, route retries, etc.
Customizable call cause code mapping
Programmable call routing: Access and manipulation of call parameters (SIP, SS7 and ISDN), including Nature of Address (NOA)
RADIUS authentication and authorization (supports multiple RADIUS servers)
NPA-NXX routing (over 5 million records)
SIP-based local number portability and CNAM lookup

H.248 (MEGACO) call control
ITU-T H.248 versions 1 and 2
UDP, SCTP, IPSec transport
DTMF and fax detection
Call progress, DTMF and COT tone generation
Call quality and inactivity alerts
H.248 control port redundancy (supports virtual IP)

Session management and billing
SIP peer availability polling
RTP inactivity monitoring, RTCP
CDR generation (RADIUS and/or csv files)
Integrated lawful intercept (ETSI ES 201 671 v.2.1.1)

OAMP+T

Operations & Administration
Provisioning, management and status GUI
CLI and configuration file machine-to-machine interface (RESTful)
Configuration change audit logging
Access, user and privilege management
SNMP V2, V3 GET, TRAPs (alarms)
Extensive SNMP call statistics MIBs

Management
Up to 4 Ethernet ports 100/1000Base-T (2 per TMG-CTRL unit)
Up to 2 VGA for local monitor (1 per TMG-CTRL unit)
Up to 8 USB ports (4 per TMG-CTRL unit)
Up to 2 DB9 RS232 serial port (2 per TMG-CTRL unit)
GUI-based and CLI system upgrade
GUI-based configuration copy, backup and restore
Storage for multiple software versions
Storage for multiple configuration files
Extensive system status display

Provisioning
Non-service affecting configuration changes
Offline configuration validation
Multiple configuration files archive
Northbound API (RESTful) for automated provisioning

Network Analytics (*TB* Analytics)
Live call trace with protocol information and ladder diagrams
Live test call with media playback and recording
TB Sigtrace – Protocol signaling capture into pcap files
Media call recording (scriptable for calling and called numbers)

Maintenance
Replaceable fan filters on telecom units

Regulatory Compliance

Safety
CAN.CSA C22.2
EN 60950-1:2005
EN 60950-1:2006

EMC
FCC Part 15:2013, Subpart B,
CE Mark (EN55022:2010, Class A, EN61000, ETSI EN 300 386)

Environmental

Operating temperature:
    0 to +70 °C, 95% rel. hum. non-condensing
Storage temperature:
    -10 to +85 °C, 95% rel. hum. non-condensing
Designed to meet NEBS Level 3
RoHS compliant

TMG7800-CTRL specification

PowerEdge R330
Intel Xeon E3-1240 v5 3.5GHz, 4C/8T processor
8M cache, 8 GB memory
200 GB RAID 1 SSD

Electrical characteristics

TMG7800 System
100 to 240 VAC, 50 to 60 Hz, -40 to -60 VDC
Redundant power supplies (for each component)
From 616 to 3210W power consumption (depending on
    configuration) per cluster

TMG7800-CTRL
100 to 240 VAC, 50 to 60 Hz
Hot-swap redundant power supplies
Maximum 350W power consumption

TMG7800 telecom unit
90 to 260 VAC, 47 to 63 Hz, -40 to -60 VDC
Hot-swap redundant power supply
Maximum 131W power consumption

TMG7800-TMS
90 to 260 VAC, 47 to 63 Hz, -40 to -60 VDC
Hot-swap redundant power supply
Maximum 72W power consumption

TMG7800-STM1-N+1 patch panel
90 to 260 VAC, 47 to 63 Hz, -40 to -60 VDC
Redundant power supply
Maximum 20W power consumption

*T*media TMG7800-CTRL, front view

Dimensions & Weight

TMG7800 Overall System
3U to 22U per cluster depending on configuration
19" rack mount
Height: 5.25" (133.4mm) to 38.5" (979mm)
Width: 17.4" (442mm)
Depth: 22" (559mm)
Weight: 60.2 lbs (27.3 kg) to 332.4 lbs (151.4 kg)

TMG7800-CTRL
1U, 19" rack mount
1.7" (42.8mm) H x 19" (482mm) W x 26.7" (677mm) D
24.5 lbs (11.2 kg)

TMG7800 telecom units
1U, 19" rack mount
1.75" (44.5mm) H x 16.9" (429mm) W x 16" (406mm) D
14.25 lbs (6.5 kg)

TMG7800-TMS
1U, 19" rack mount
1.75" (44.5mm) H x 16.9" (429mm) W x 16" (406mm) D
17lbs (7.71 kg)

TMG7800-N+1 patch panel
1U, 19" rack mount
1.75" (44.5mm) H x 16.9" (429mm) W x 16" (406mm) D
12.2 lbs (5.6 kg)

TMG7800-1+1 patch panel
1U, 19" rack mount
1.75"(44.5 mm)H x 16.9"(429 mm)W x 5.25"(133 mm)D
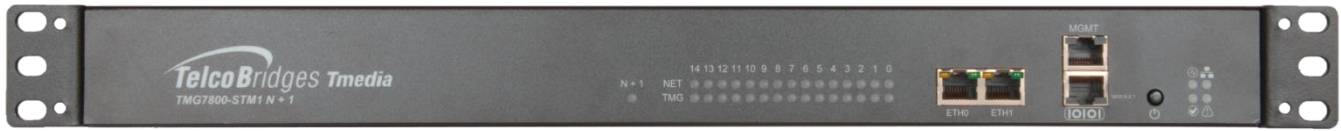3.4 lbs (1.6 kg)

*T*media TMG7800 telecom unit, front view

*T*media TMG7800-T1E1 telecom unit, rear view

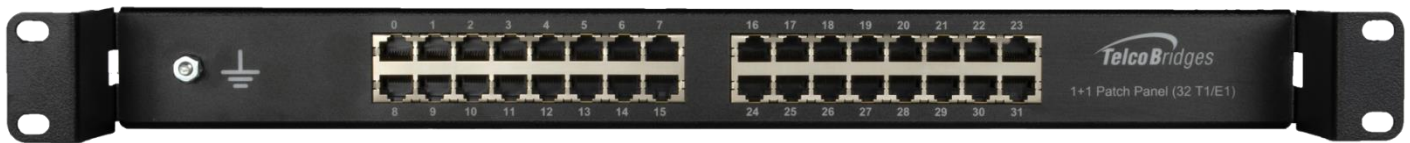*T*media TMG7800-DS3 telecom unit, rear view

*T*media TMG7800-STM1 telecom unit, rear view

*T*media TMG7800-STM1-N+1 unit, front view

*T*media TMG7800-STM1-N+1 unit, rear view

*T*media TMG7800-TE 1+1, Patch Panel (front view)

*T*media TMG7800-DS3 1+1, Patch Panel (front view)

*T*media TMG7800-STM1 1+1, Patch Panel (front view)