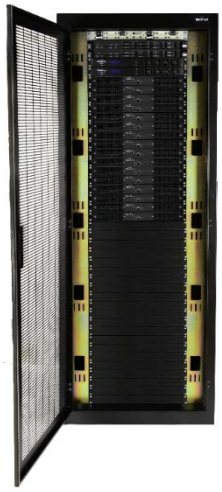
# TMG7800 VoIP Gateway
# 512 to 32,768 channels per cluster
# Up to 4 clusters for 131,072 channels



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:

- 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

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## TMG7800 System

### TMG7800 solution components

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)

### TMG7800-CTRL

Manages all components in the system
Performs call control on all components
Supports active/standby redundancy

### TMG7800 telecom unit

Runs signaling stacks
Provides TDM and VoIP network interfaces
Hardware accelerated media processing and transcoding
Each additional unit adds more capacity to the system

### TMG7800-TMS (optional)

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

### 1+1 Patch Panel (optional)

TDM facility protection group for two telecom units
Passive protection (no power required)

### N+1 Patch Panel (optional)

TDM facility protection group for up to 15 telecom units

## Capacity and Voice Processing

### PSTN interfaces

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

### VoIP interfaces

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

### Vocoding

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

### Fax/modem/data

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

### DTMF relay

RFC 2833/4733, SIP INFO method, in-band

### Echo cancellation

G.168 echo cancellation
128 ms echo tail on all channels simultaneously

### Voice processing

Adaptive and programmable jitter buffer (20 to 200 ms)
Voice activity detection (VAD)
Comfort noise generation (CNG)

### Voice recording and announcement playback

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

### *T*media 1+1 solution (optional)

The *T*media 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

*T*media 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)

### *T*media N+1 solution (optional)

The *T*media 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

*T*media 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)

### HS Code

85176200

## 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

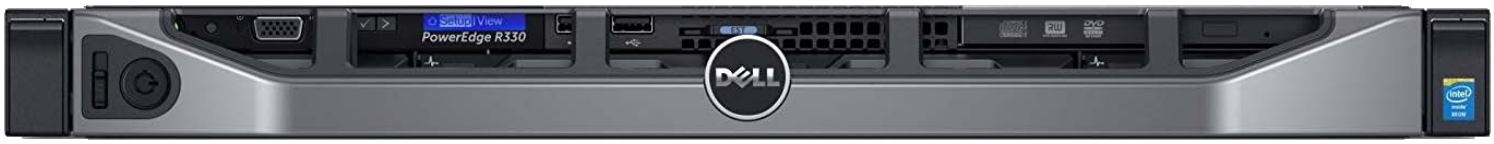
TMG7800 System
100 to 240 VAC, 50 to 60 Hz, -40 to -60 VDC
Redundant power supplies (for each component)
From 616 to 3210W power consumption (depending on configuration) per cluster

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

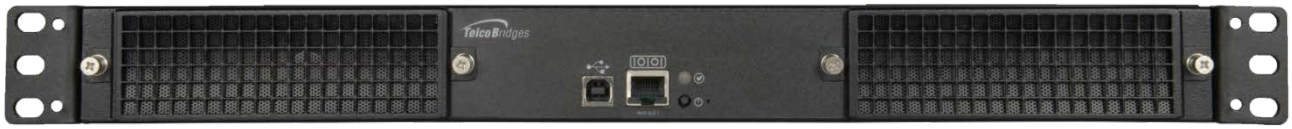
1U, 19” rack mount
1.75” (44.5mm) H x 16.9” (429mm) W x 16” (406mm) D
17lbs (7.71 kg)

TMG7800-N+1 patch panel

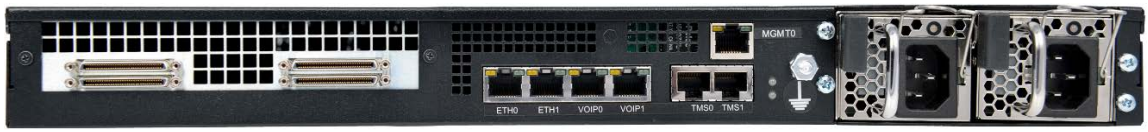
1U, 19” rack mount
1.75” (44.5mm) H x 16.9” (429mm) W x 16” (406mm) D
12.2 lbs (5.6 kg)

TMG7800-1+1 patch panel

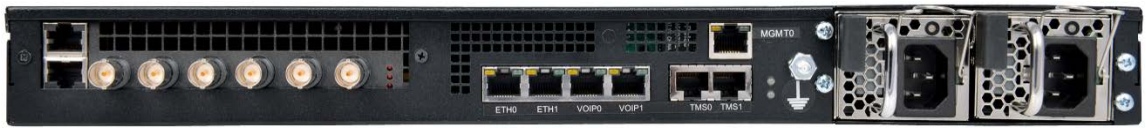
1U, 19” rack mount
1.75”(44.5 mm)H x 16.9”(429 mm)W x 5.25”(133 mm)D
3.4 lbs (1.6 kg)



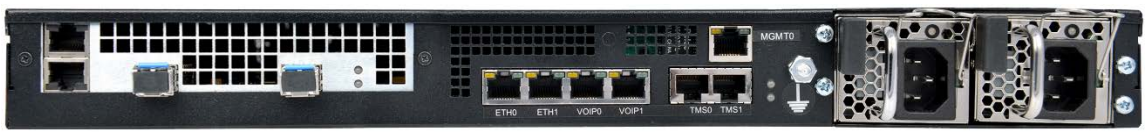
*T*media TMG7800 telecom unit, front view



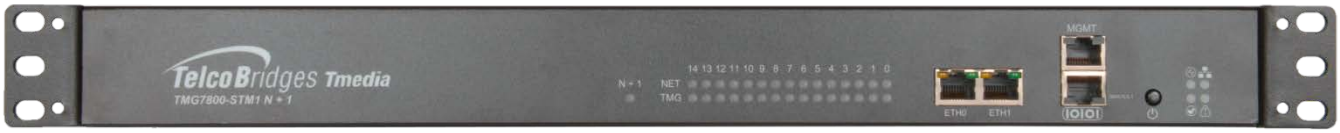

*T*media TMG7800-T1E1 telecom unit, rear view



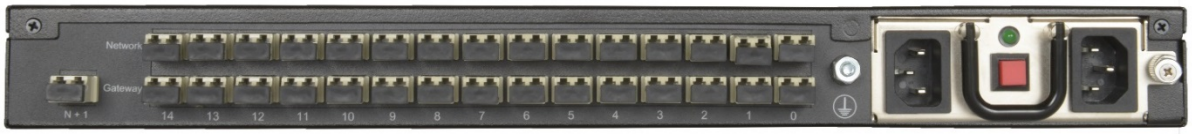

*T*media TMG7800-DS3 telecom unit, rear view



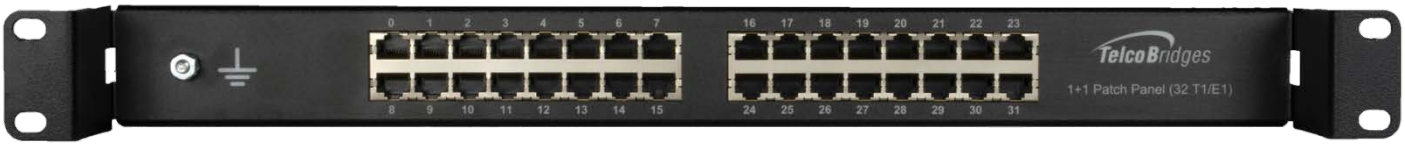

*T*media TMG7800-STM1 telecom unit, rear view




*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)