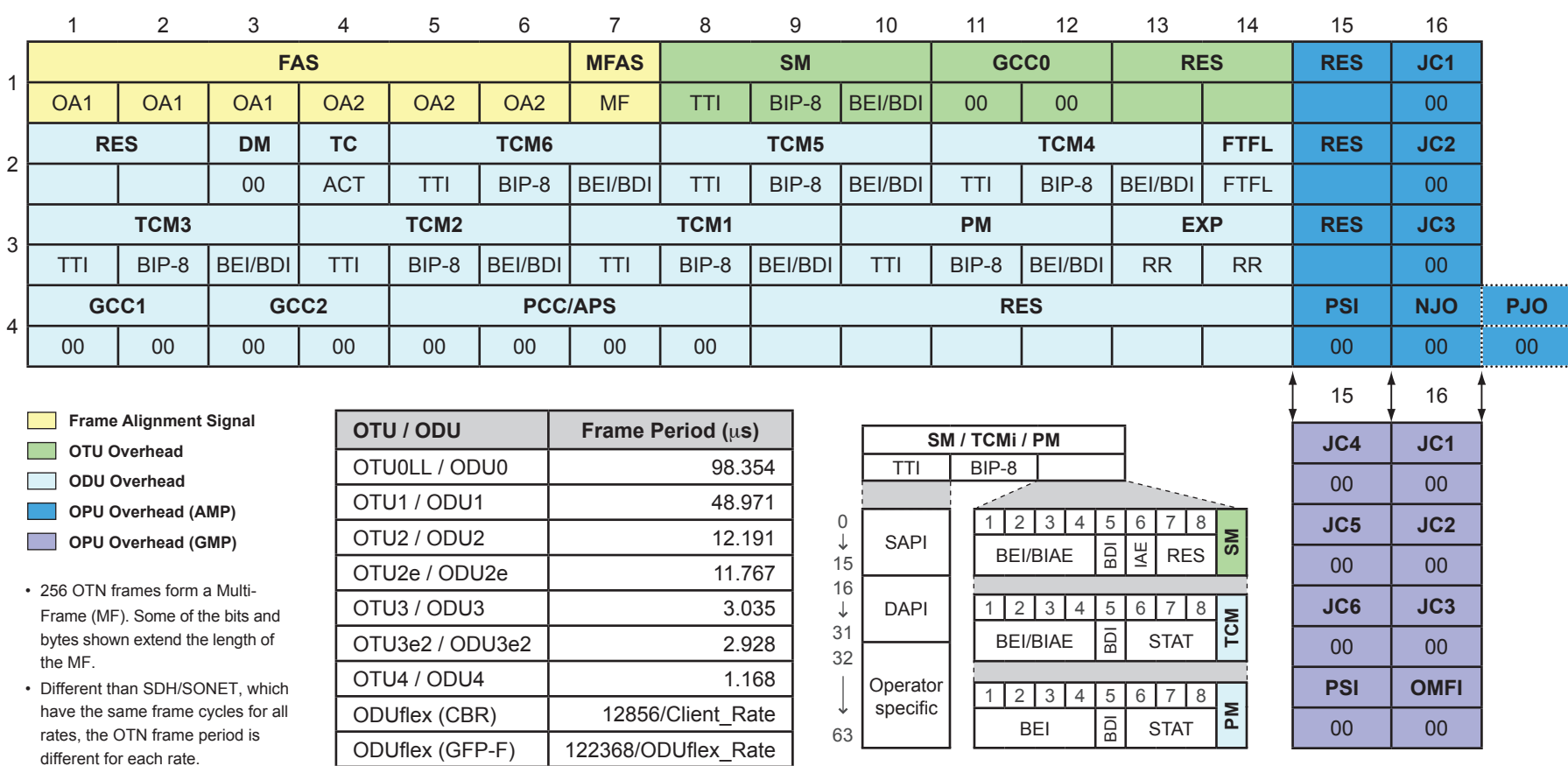


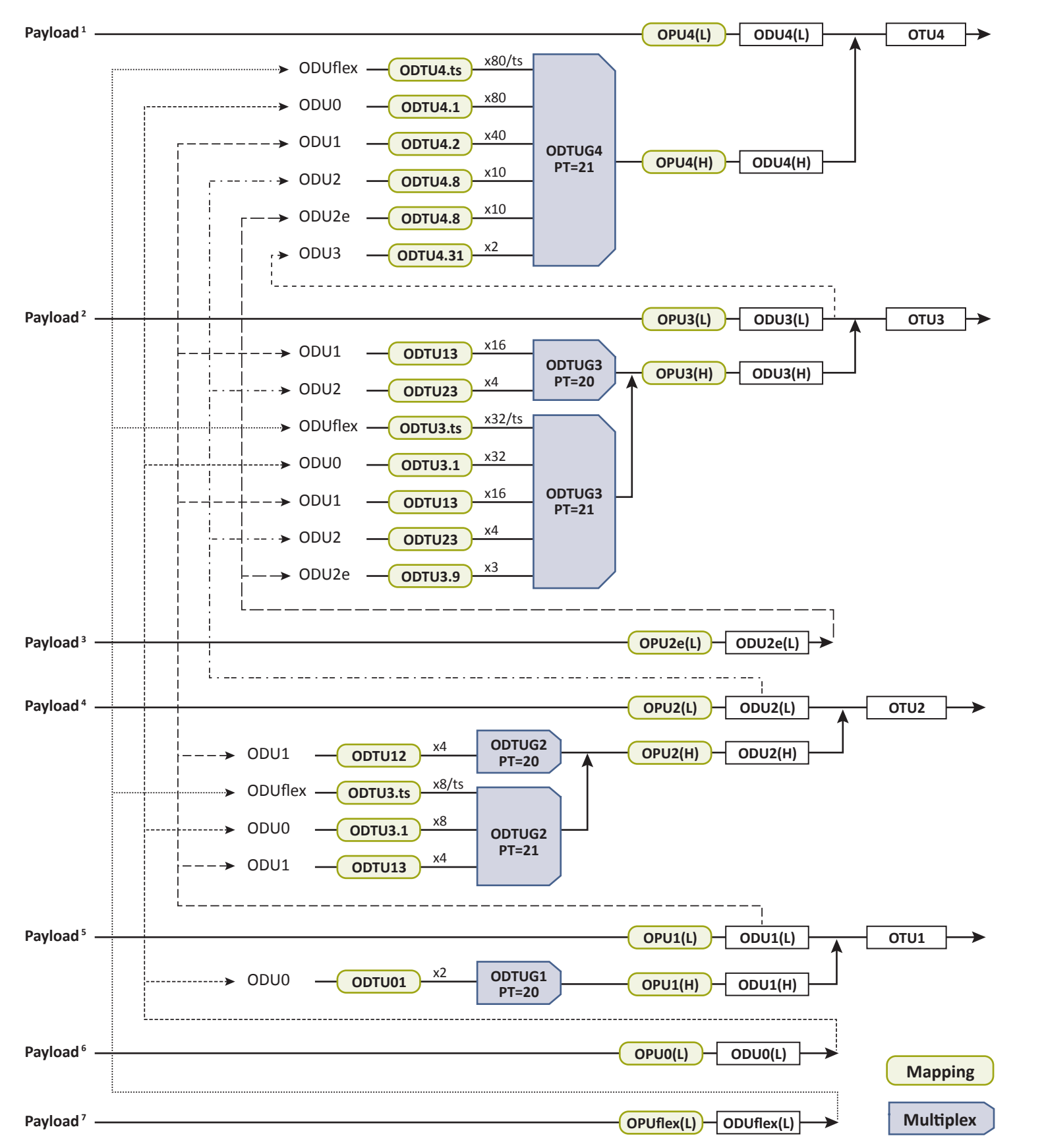
# OTN - Optical Transport Networks

GLOSSARY	
3R	Reamplification, Reshaping and Retiming
ACT	TC Activation/deactivation control channel
AMP	Asynchronous Mapping Procedure
APS	Automatic Protection Switching
BDI	Backward Defect (Alarm) Indication
BEI	Backward Error Indication
BIAE	Backward Incoming Alignment Error
BIP-8	Bit Interleave Parity - level 8 (8 bit)
BMP	Bit-synchronous Mapping Procedure
CAUI	100G Attachment Unit Interface (100 = C in roman)
CBR	Constant Bit Rate
CPRI	Common Public Radio Interface (cellular)
DAPI	Destination Service Point Identifier
Dmp	Delay Measurement - Path level
DMti	Delay Measurement - Tandem connection level i
EXP	Experimental
FC	Fibre Channel
FEC	Forward Error Correction
FTFL	Fault Type Fault Location
GCC	General Communication Channel (GCC0, GCC1, GCC2)
GE	Gigabit Ethernet
GFP	Generic Framing Procedure
GFP-F	GFP Framed
GFP-T	GFP Transparent (transcoding)
GMP	Generic Mapping Procedure
HO	High Order (H)
laDI	Intra-Domain Interface (within operator's domain)
lDI	Inter-Domain Interface (between operators) with 3R processing
JC	OPU Justification Control (3 for AMP, 6 for GMP)
LO	Low Order (L)
MF	Multi-Frame
MFAS	Multi-Frame Alignment Signal
MSI	Multiplexer Structure Identifier
NJO	OPU Network Justification Opportunity (AMP)
NNI	Network to Network Interface
OBSA	Open Base Station Architecture Initiative (cellular)
OCC/OCCr	Optical Channel Carrier (r = reduced functionality)
Och/Ochr	Optical Channel (r = reduced functionality)
ODUG	Optical channel Data Tributary Unit Group
ODUjk	Optical channel Data Tributary Unit, j into k
ODUjk.ts	Optical channel Data Tributary Unit, with tributary slots
ODU	Optical channel Data Unit
OH	Overhead
OMFI	OPU Multi-Frame Identifier (GMP) OTU4
OMS	Optical Multiplex Section
OPS	Optical Physical Section
OPSM	Optical Physical Section Multi-lane
OPU	Optical channel Payload Unit
OSC	Optical Supervisory Channel
OTLCx	Optical channel Transport Lane Carrier (x = optical lane)
OTM	Optical Transport Module
OTN	Optical Transport Network ("Digital Wrapper")
OTS	Optical Transmission Section
OTU	Optical channel Transport Unit
OWD	One-Way Delay
PCC	Protection Communication Channel (APS)
PCS	Physical Coding Sub-layer
PM	Path Monitoring (ODUK)
PSI	Payload Structure Identifier (OPU)
PT	Payload Type
PT=20	ODU multiplex structure (old) ODTUjk
PT=21	1.25G multiplexing (new) ODTUjk & ODTU.ts
RTD	Round Trip Delay
RES	Reserved
SAPI	Source Access Point Identifier
SDT	Service Disruption Time
SM	Section Monitoring (OTUK)
STAT	Status bits
TC	Tandem Connection
TCMi	Tandem Connection Monitoring (i = 1 to 6)
TS	Tributary Slot
TTI	Trail Trace Identifier
TTT	Timing Transparent Transcoding (compressed)
UNI	User to Network Interface
WDM	Wavelength Division Multiplexing
XLAI	40G Attachment Unit Interface (40 = XL in roman)
CFP	C Form-factor Pluggable interface module (C = 100G)
SFP	Small Form-factor Pluggable interface module
XFP	X Form-factor Pluggable interface module (X = 100G)

## OTN Overhead Bytes



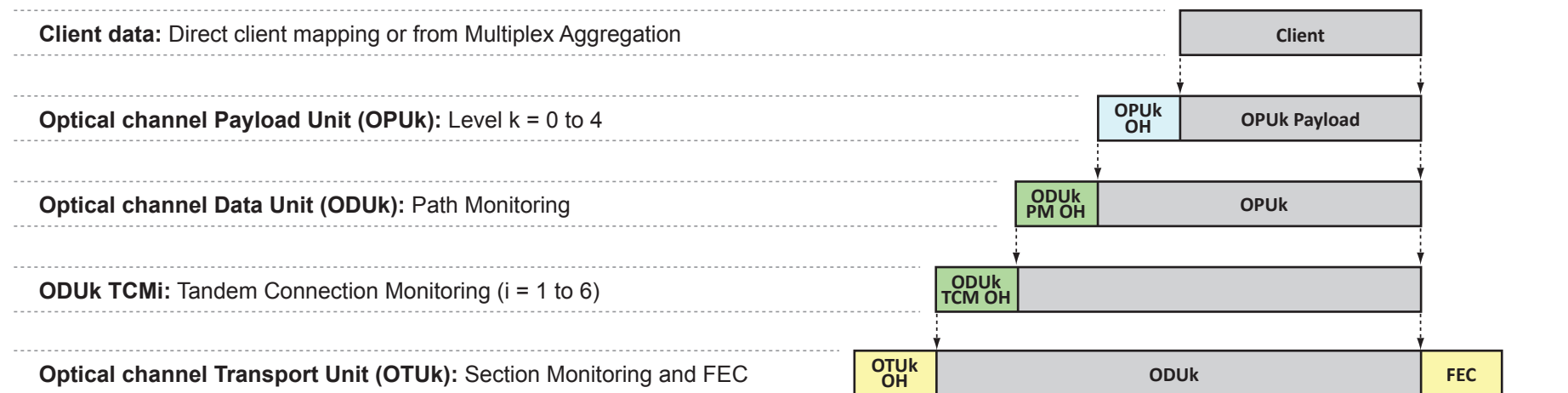
## Mapping and Multiplexing Structure



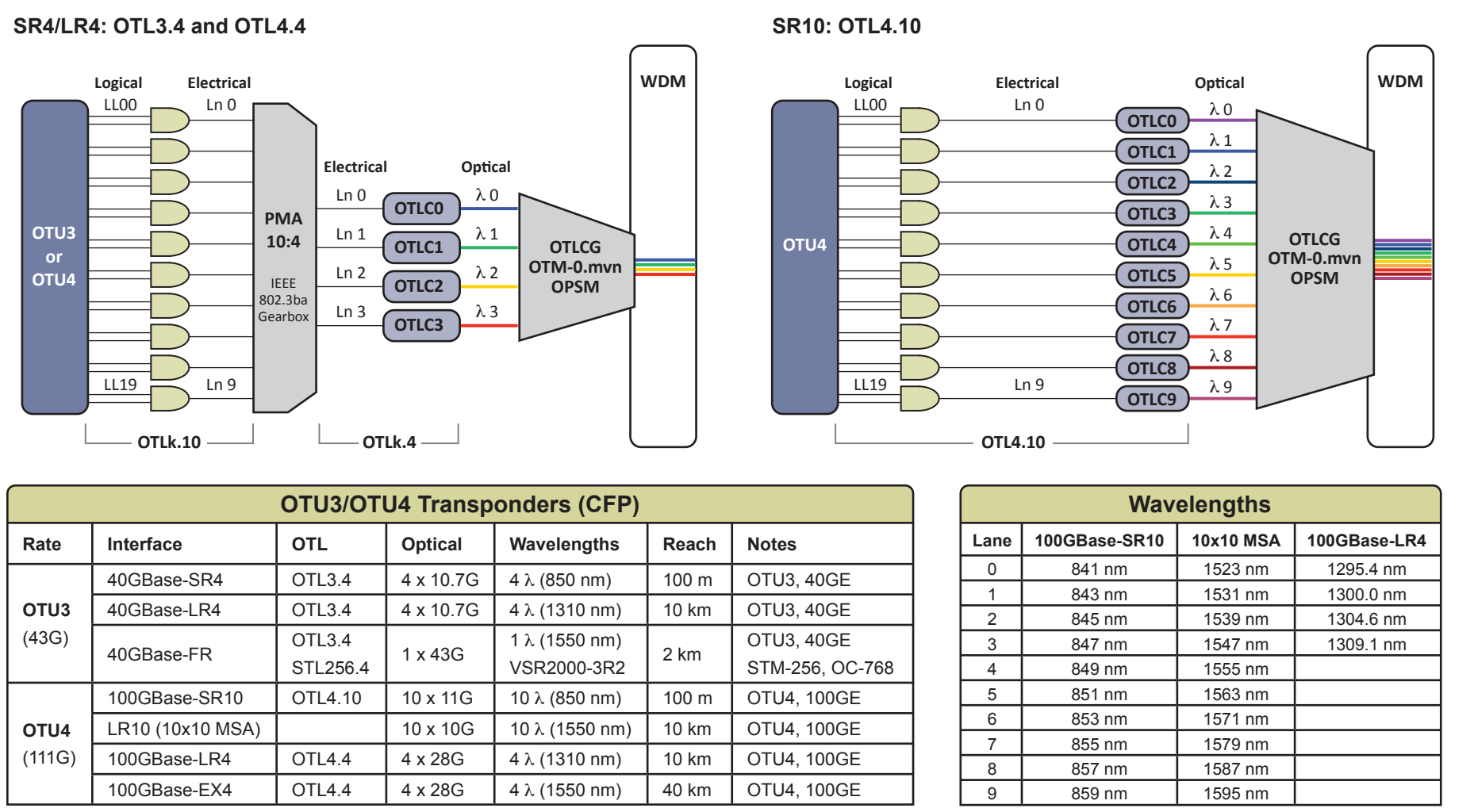
## Errors and Alarms

OTL		OTU	
LLM	Logical Lane Marker Error	FAS	Frame Alignment Signal Error (mismatch)
FAS	Logical Lane Frame Alignment Error	MFAS	Multi-Frame Alignment Signal error (mismatch)
MFAS	LL Multi-Frame Alignment Error	SM-TIM	Trail Trace Identifier Mismatch
LOS	Loss of Signal	SM-BIP-8	Received and expected TTI are different
LOL	Loss of logical Lane alignment	SM-BEI	Number of BIP-8 violations detected
OOL	Out of logical Lane alignment	SM-BIAE	Backward Incoming Alignment Error (BEI/BIAE bits)
OOF	LL Out of Frame (FAS error ≥ 5 frames)	SM-OCI	Open Connection Indication
LOF	LL Loss of Frame (consecutive OOF ≥ 3 ms)	SM-BDI	Backward Defect Indication
OOR	Out of Recovery (wrong LLM value for ≥ 5 cycles)	SM-IAE	Incoming (Frame) Alignment Error
LOR	Loss of Recovery (consecutive OOR ≥ 3 ms)		
OOLLM	Out of Logical Lane Marker (LLM errors ≥ 5 frames)		
OOMFAS	Out of LL MFAS (MFAS errors ≥ 5 frames)		
High Skew	Skew for any of the lanes is greater than a threshold (limit) value set for the application		

## Basic OTN Frame Structure



## OTLk.n - Optical Transport Lanes



## Rates and Payloads

Physical Rates, Containers, and Payloads				
OTUK	OTU Bit Rate (Gbps)	OPUK	Payload Rate (Gbps)	Client Types
1	OTU4	111.809973	OPU4	104.355975
2a	OTU3e2	44.583356	OPU3e2	41.611131
2b	OTU3	43.018414	OPU3	40.150519
3	OTU2e	11.095730	OPU2e	10.356012
4	OTU2	10.709255	OPU2	9.995277
5	OTU1	2.666057	OPU1	2.488320
6	OTU0LL	1.327451	OPU0	1.238954
7a			OPUflex (CBR)	Client dependent
7b			OPUflex (GFP-F)	Client dependent



ODU-FTFL*		
Byte 0	00	No fault
	01	Signal fail
	02	Signal degrade
	03	FF Reserved
Bytes 1..9	Operator-identifier field (forward)	Downstream
Bytes 10..127	Operator-specific field (forward)	Downstream
Byte 128	00	No fault
	01	Signal fail
	02	Signal degrade
	03	FF Reserved
Bytes 129..137	Operator-identifier field (backward)	Upstream
Bytes 138..255	Operator-specific field (backward)	Upstream

GMP		
LO-Sync	Loss of Synchronization	Local
Cm=0	No payload	Local
CRC-5	CRC-5 Error	Local
CRC-8	CRC-8 Error	Local