

Revision History				
Date	Description			
05 Oct 2017	1.0			
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Checklist Use Information				
It has been defined within the checklist:				
1) The 'must-have' requirements that a colocation facility would need to enable the trouble free and smooth implementation of an Open Rack V2 that is populated and weighs 500kg and has an IT load of 6.6kw.				
2) There is also additional guidance information in the checklist matrix where the 'must-have' line item is in the column titled 'acceptable' i.e. racks fed by a central UPS upstream circuit				
3) The "nice to have" requirements that is in the column titled 'acceptable' e.g. secure storage area that is sufficiently sized to accommodate 24 crated or uncrated racks				
4) The 'considerations' requirements that should be evaluated to understand if they are applicable to the particular colo / solution provider e.g. the need for a pallet ramp to be made available on delivery of the OR.				
5) There is also additional guidance information in the checklist matrix where the 'consideration' line item is in the column titled 'optimum', an example of this would be a non central UPS upstream supply that feeds a power shelf that contains a BBU.				

Data Center Subsystems	Attribute	Acceptable	Optimum	Actual	Notes
Data Center Access	must-have				
Data Center Access	Access routes from loading dock to Goods in Area (Storage)	Road level, step and threshold free access	loading dock with lift or leveller		
Data Center Access	Access routes from loading dock to Goods in Area (Storage) delivery pathway	2.7m High x 1.2m Wide unobstructed access and threshold free	2.7m High x 2.4m Wide x 2.4 m Deep unobstructed access and threshold free		
Data Center Access	Ramps - Gradient	1:12	None		
Data Center Access	Ramps - Width	1.2m	1.5m		
Data Center Access	Ramps - Landing area	1.2m X 1.2m	1.5m X 1.5m		
Data Center Access	Ramps - Railings	900mm - 1000mm	900mm - 1000mm		
Data Center Access	Corridor floor rolling load	567Kg (1250lb) (5.56kn)	680Kg (1500 lb) (6.67kn)		
Data Center Access	Unboxing/ pre-staging/storage area floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2)(11.97 kn/m2)		
Data Center Access	Unboxing/ pre-staging/ storage area floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)		
Data Center Access	Lift / Elevator Weight Loading	1500kg	3000kg		
Data Center Access	Lift / Elevator Door Height	2.4m lift door opening height (not internal cabin)	2.4m lift door opening height (not internal cabin)		
Data Center Access	Lift / Elevator Width	1.2m unobstructed door opening width	1.5m unobstructed door opening width		
Data Center Access	Lift / Elevator Depth	1.5 m unobstructed cabin depth	1.5m unobstructed cabin depth		
Data Center Access	Access routes from loading dock to White Space delivery pathway	1.2m Wide x 2.4m High unobstructed access and threshold free	1.8m Wide x 2.4m High unobstructed access and threshold free		
Data Center Access	White Space access floor underfloor clearance if not used for cooling	450mm	450mm		
Data Center Access	White space access floor clearance if used for cooling	N/A	900mm		
Data Center Access	White Space access floor rolling load	567Kg (1250lb) (5.56kn)	680Kg (1500 lb) (6.67kn)		
Data Center Access	White Space access floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2)(11.97 kn/m2)		
Data Center Access	White Space access floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)		
Data Center Access	White Space slab floor rolling load	567Kg (1250lb) (5.56kn)	680Kg (1500 lb) (6.67kn)		
Data Center Access	White Space slab floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2)(11.97 kn/m2)		
Data Center Access	White Space slab floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)		
Data Center Access	White Space finished floor to ceiling height	3.1m	4.5m		
Data Center Access	nice-to-have				
Data Center Access	Pallet ramp		Available		
Data Center Access	Goods In Area	Sufficiently sized to accommodate 24 crated cabinets (add size in sq. m/ sq. ft.)	Sufficiently sized to accommodate 50 crated cabinets (add size in sq. m/ sq. ft.)		
Data Center Access	Secure storage area	Sufficiently sized to accommodate 24 crated or uncrated racks	Sufficiently sized to accommodate 50 crated or uncrated racks		
Electrical Systems	must-have				
Electrical Systems	In Rack Power shelf	2+1 redundancy	5+1 redundancy		

Data Center Subsystems	Attribute	Acceptable	Optimum	Actual	Notes
Electrical Systems	Number of independent circuits to the rack	1N (A)	2N (A+B)		
Electrical Systems	Circuit Capacity	3φ 16A	3φ 32A		
Electrical Systems	Power receptacle / WIP type	IEC60309-2 5 wire or IEC-309 16A	IEC60309-2 5 wire or IEC-309 32A		
Electrical Systems	Voltage (single phase)	180 – 264 VAC	180 – 264 VAC		
Electrical Systems	Frequency	47-63 Hz	47 - 63 Hz		
Electrical Systems	Central, upstream UPS	Yes - if no BBU	No- with BBU		
Electrical Systems	considerations				
Electrical Systems	In Rack Battery Backup Unit (BBU)	Li-ion	Li-ion or LiFePO4		
Electrical Systems	BBU Autonomy time	90 Seconds	>3 minutes		
Electrical Systems	Central, upstream UPS	None	None		
Electrical Systems	Generator Start-up time (if using rack BBU)	< 1 minute	< 1 minute		
Cooling System	must-have				
Cooling System	Rack airflow direction	Front to Back	Front to Back		
Cooling System	Air containment methods	Containment hot/cold applicable for all cabinets in white space	Hot aisle containment		
Cooling System	Minimum width cold aisle	1200 mm	1200 mm		
Cooling System	Minimum free width cold aisle (inside cage)	900 mm	900 mm		
Cooling System	Minimum width hot aisle	1200 mm	1200 mm		
Cooling System	Inlet Air Temperature & Humidity allowed	Temperature set point: 80% of time ASHRAE recommended Temperature SLA: 100% of time ASHRAE allowable Humidity SLA: ASHRAE allowable + non condensing on servers	Temperature set point: 80% of time ASHRAE recommended Temperature SLA: 100% of time ASHRAE allowable Humidity SLA: ASHRAE allowable + non condensing on servers		
Cooling System	Cabinet blanking of open slots	Mandatory for all cabinets in white space	Same as acceptable		
Cooling System	DeltaT	12c	To be developed		
Cooling System	considerations				
Cooling System	Rack POD space planning in White Spaces	To be developed	To be developed		
Cooling System	Air Quality (Particles/Air filtering requirements)	To be developed	To be developed		
Telecommunications Cabling, Infrastructure, Pathways & Spaces	must-have				

Data Center Subsystems	Attribute	Acceptable	Optimum	Actual	Notes
Cabling Pathways & Spaces	Bottom and top entry into Racks for power and network connectivity	Top or bottom & front of rack fed	Top & front of rack fed		
Telecommunications Cabling, Infrastructure, Pathways & Spaces	considerations				
Cabling Pathways & Spaces	Clearance between TOR to ceiling for two levels of containment				
Cabling Pathways & Spaces	Level one - Intra POD cabling				
Cabling Pathways & Spaces	Level two - Inter POD cabling				
Cabling Pathways & Spaces	Tertiary cabling pathway for OOB network (Level two)				
Cabling Pathways & Spaces	Wire basket	Min size	Optimum size		
Cabling Pathways & Spaces	Wire basket support				
Cabling	Fibre Cable Flame rating	OFNP / LSZH			
Cabling	Fibre Cable Structure				
Cabling	Fibre count				
Cabling	Fibre Type: Multimode	OM3	OM4		
Cabling	Fibre Type: Single Mode		OS2		
Cabling	Patch Panel Location	TOR	TOR or fixed to underside of basket		
Cabling	Patch Panel Connector presentation		Interchangeable LC and MPO		
Cabling	Patch Panel Connector density	LC - 24 pairs per 1U MPO - 24 per 1U	LC - 48 pairs per 1U MPO - 48 per 1U		
Cabling	Patch Panel Colour		Light colour (white / light grey)		
Cabling	Copper Cable Category	Cat6	Cat 6a		
Cabling	Copper cable TOR/Leaf to Server/Storage Connectivity				
Cabling	Direct Attach Copper (DAC)				
Cabling	Copper Cable TOR/Leaf to Server/Storage Connectivity				
Cabling	Copper Cable TOR to Leaf connectivity				
Cabling	Active Optical Assembly (AOC)				
Cabling	TOR to Leaf connectivity				
Cabling	Leaf to spline connectivity				
Network Infrastructure	considerations				
Network Infrastructure	Spine & Leaf Network layout				
Network Infrastructure	Max Link distance Spine to Leaf		300m		
Network Infrastructure	Switch Location				
Network Infrastructure	Spine		MDA		
Network Infrastructure	Leaf	TOR	HAD		
Network Infrastructure	Spine & Leaf Network: TOR Switch				
Network Infrastructure	TOR Switch Transmission speed		10Gb/s or 40Gb/s or 100Gb/s		
Network Infrastructure	TOR Switch Port Count		16, 24, 32 or 48		
Network Infrastructure	Leaf Switch				

Data Center Subsystems	Attribute	Acceptable	Optimum	Actual	Notes
Network Infrastructure	Leaf Switch Transmission speed		40Gb/s or 100Gb/s		
Network Infrastructure	Leaf Switch Port Count		16, 24, 32, 48 or 64		
Network Infrastructure	Spine Switch				
Network Infrastructure	Spine Switch Transmission speed		40Gb/s or 100Gb/s or 400Gb/s		
Network Infrastructure	Spine Switch Port Count		16, 24, 32, 48 or 64		
Network Infrastructure	Spine & Leaf Network Media				
Network Infrastructure	TOR/Leaf to Server/ Storage Connectivity (Intra Rack)	Twisted Pair	DAC / Fibre		
Network Infrastructure	TOR to Leaf connectivity (Intra Pod)	DAC	AOC / Fibre		
Network Infrastructure	Leaf to spline connectivity (Inter Pod)	N/A	Fibre		

OCP data center project - colo facility requirements for open racks_checklist rev (01) 02 Mar 17	Acceptable		Optimum	Note Reasoning Acceptable	Note Reasoning Optimum	Facility Suitability Guidance Notes	Checklist Notes
Data Center Subsystems							
Architectural							
Data Center Access							
Access routes from loading dock to Goods in Area (Storage)							
must-have							
Access	Road level, step and threshold free access	loading dock with lift or leveller			An optimum access design is to use a loading dock with an integral lift or leveller that allows packaged racks on pallets to be transported directly from inside truck level to the data centre goods in area. The advantages of this type of loading dock are 1) Any truck with or without a lifting platform can be used for deliveries 2) Speed of off loading 3) It is a safer method and there is less risk to equipment and personnel.		
Delivery pathway	2.7m High x 1.2m Wide unobstructed access and threshold free	2.7m High x 2.4m Wide x 2.4 m Deep unobstructed access and threshold free	An extra height allowance of 490mm above the height of a 2210mm OR is required because we need to take into account that racks are packaged and bolted on pallets and usually manoeuvred using a pallet truck.		An optimum depth measurement of 2.4m should also be considered if a there is a security air lock in place between the external and internal space.		
Ramps All Access Areas							
Gradient	1:12	No ramps					
Width	1.2m	1.5m					
Landing area	1.2m X 1.2m	1.5m X 1.5m	This does not allow for cabinet rotation		This will allow for rotating the cabinet		
Railings	900mm - 1000mm	900mm - 1000mm	UK building regulations specify that handrails to be between 900mm and 1000mm above surface or steps pitch line / 900mm and 1100mm above surface of landings		UK building regulations specify that handrails to be between 900mm and 1000mm above surface or steps pitch line / 900mm and 1100mm above surface of landings		
Floor loading All Access Areas							
Corridor floor rolling load	567Kg (1250lb) (5.56kn)	680Kg (1500 lb) (6.67kn)				Spreader plates with a spreader plate ramp can be used e.g. 9mm (0.5in) thick plywood or hardboard to increase rolling load capacity and protect the floor from damage by the rack castors	
Unboxing/ pre-staging/storage area floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2) (11.97 kn/m2)					
Unboxing/ pre-staging/ storage area floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)					
Lift All Access Areas (If Applicable)							
Weight Loading	1500kg	3000kg	ORV2 has a standard 500kg base load and 1400Kg heavy load therefore with a lift of this specification up to (3) ORV2s @ 500Kg could be transported together. 1500kg is a standard maximum lift load specification.		ORV2 has a standard 500kg base load and 1400Kg heavy load therefore with a lift of this specification up to (2) ORV2 @ 1400kg could be transported together. 3000kg is a standard maximum lift load specification.		
Door Height	2.4m lift door opening height (not internal cabin)	2.4m lift door opening height (not internal cabin)					
Width	1.2m unobstructed door opening width	1.5m unobstructed door opening width					
Depth	1.5 m unobstructed cabin depth	1.5m unobstructed cabin depth					
nice-to-have							
Pallet ramp			Awareness only refer to guidance note			If there is no integral ramp included within the rack packaging a ramp is required to get the rack off the pallet and on to its castors.	

OCP data center project - colo facility requirements for open racks_checklist rev (01) 02 Mar 17	Acceptable		Optimum	Note Reasoning Acceptable	Note Reasoning Optimum	Facility Suitability Guidance Notes	Checklist Notes
Goods In Area	Sufficiently sized to accommodate 24 crated cabinets (add size in sq. m/ sq. ft.)		Sufficiently sized to accommodate 50 crated cabinets (add size in sq. m/ sq. ft.)			Racks could be taken straight to the unboxing/ pre-staging area so a requirement for this may not be required? This may be required as it may not be possible for the white glove service to be able to transport the delivered racks into position in the white space on the day of delivery	
Secure storage area	Sufficiently sized to accommodate 24 crated or uncrated racks		Sufficiently sized to accommodate 50 crated or uncrated racks				
Access routes from loading dock to White Space							
must-have							
Delivery pathway	1.2m Wide x 2.4m High unobstructed access and threshold free		1.8m Wide x 2.4m High unobstructed access and threshold free	Width of 1.2m has been calculated as a multiple of a standard width access floor tile of .6m. As the height of an ORV2 with castors is a minimum of 2.2m an extra clearance tolerance of .2m should be sufficient to allow for any variance from this.	Width of 1.8m has been calculated as a multiple of a standard width access floor tile of .6m. As the height of an ORV2 with castors is a minimum of 2.2m an extra clearance tolerance of .2m should be sufficient to allow for any variance from this.		
Corridor floor rolling load	567Kg (1250lb) (5.56kn)		680Kg (1500 lb) (6.67kn)	Spreader plates with a spreader plate ramp can be used e.g. 9mm (0.5in) thick plywood or hardboard to increase rolling load capacity and protect the floor from damage by the rack castors	Spreader plates may not be required		
Ramps							
Gradient	1:12		None				
Width	1.2m		1.5m				
Landing area	1.2m X 1.2m		1.5m X 1.5m				
Railings	900mm - 1000mm		900mm - 1000mm	UK building regulations specify that handrails to be between 900mm and 1000mm above surface or steps pitch line / 900mm and 1100mm above surface of landings	UK building regulations specify that handrails to be between 900mm and 1000mm above surface or steps pitch line / 900mm and 1100mm above surface of landings		
Lifts (If applicable)							
Weight Loading	1500kg		3000kg	ORV2 has a standard 500kg base load and 1400Kg heavy load therefore with a lift of this specification up to (3) ORV2s @ 500Kg could be transported together. 1500kg is a standard maximum lift load specification.	ORV2 has a standard 500kg base load and 1400Kg heavy load therefore with a lift of this specification up to (2) ORV2 @ 1400kg could be transported together. 3000kg is a standard maximum lift load specification.		
Door Height	2.4m lift door opening height (not internal cabin)		2.4m lift door opening height (not internal cabin)				
Width	1.2m unobstructed door opening width		1.5m unobstructed door opening width				
Depth	1.5 m unobstructed cabin depth		1.5m unobstructed cabin depth				
White Space							
Access Floor Clearance (If applicable)							
Access floor underfloor clearance if not used for cooling	450mm		450mm				
Access floor clearance if used for cooling	N/A		900mm				
Access Floor Load							
Access floor rolling load	567Kg (1250lb) (5.56kn)		680Kg (1500 lb) (6.67kn)	Spreader plates with a spreader plate ramp can be used e.g. 9mm (0.5in) thick plywood or hardboard to increase rolling load capacity and protect the floor from damage by the rack castors	Spreader plates may not be required		

OCP data center project - colo facility requirements for open racks_checklist rev (01) 02 Mar 17	Acceptable	Optimum	Note Reasoning Acceptable	Note Reasoning Optimum	Facility Suitability Guidance Notes	Checklist Notes
Access floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2) (11.97 kn/m2)			It is important to make sure that the access floor load specification matches the slab floor load specification that the access floor is supported by. If the floor loading specification is insufficient to support the racks it may be possible to increase the floor loading capacity by the introduction of additional structural steels and supporting pedestals under the access floor. If the floor loading specification for the access floor and slab floor is insufficient to support the racks it may be possible to increase the floor loading capacity by the replacement of the access floor / add supporting pedestals and /or the introduction of additional structural steels and supporting pedestals under the access floor.	
Access floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)				
Slab Floor						
Slab floor rolling load	567Kg (1250lb) (5.56kn)	680Kg (1500 lb) (6.67kn)				
Slab floor uniform load	732 kg/m2 (150 lb/ft2)(7.17 kn/m2)	1221 kg/m2 (250 lb/ft2) (11.97 kn/m2)				
Slab floor concentrated load	567 kg (1250 lb) (5.67kn)	680 kg (1500 lb) (6.67kn)				
Ceilings						
Finished Floor to ceiling height	3.1m	4.5m				
Electrical Systems						
must-have						
In Rack Power shelf Single 6.6kw						
Number of independent circuits to the rack	1N (A)	2N (A+B)		Redundant circuits and paths providing improved resilience		
Circuit Capacity	3φ 16A	3φ 16A	Circuit capacity requirement for 6.6kw power shelf			
Power receptacle / WIP type	IEC60309-2 5 wire or IEC-309 16A / IEC-309 16A 1P	IEC60309-2 5 wire or IEC-309 32A / IEC-309 32A 1P				
Required Power Quality						
Voltage (single phase)	180 – 264 VAC	180 – 264 VAC				
Frequency	47-63 Hz	47 - 63 Hz				
Central, upstream UPS	Yes					
considerations						
In Rack Power shelf Single 12.5kw					Supplied by Solution Provider	
Number of independent circuits to the rack	1N (A)	2N (A+B)		Redundant circuits and paths providing improved resilience		
Circuit Capacity	3φ 32A	3φ 32A	Standard rectifier size in a power shelf is 12.5kw	Standard rectifier size in a power shelf is 12.5kw		
Power receptacle / WIP type	IEC60309-2 5 wire	IEC60309-2 5 wire				
Redundancy	2+1	5+1				
In Rack Power shelf Dual 12.5kw - 25kw total					Supplied by Solution Provider	
Number of independent circuits to the rack	1N (A)	2N (A+B)		Redundant circuits and paths providing improved resilience		
Circuit Capacity	3φ 32A	3φ 32A	Circuit capacity requirement for 25kw power shelf	Circuit capacity requirement for 25kw power shelf		
Power receptacle / WIP type	IEC60309-2 5 wire	IEC60309-2 5 wire				
Redundancy	2+1	5+1				
In Rack Battery Back Up					Supplied by Solution Provider	
Li-ion LES (or LiFePO4)	Li-ion	Li-ion or LiFePO4				
Autonomy time	90 Seconds	>3 minutes			There could be a requirement where the colo facility monitors the health of the BBU using its DCIM as part of the SLA	
Central, upstream UPS	Partial	No			There could be a case where requirement is Feed A is non-UPS but Feed B is from central UPS. Non-UPS supply to be taken from the input board (or generator / HV distribution board after the ATS) should be considered.	

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Required Power Quality for online operation							
Voltage (single phase)	180 – 264 VAC	180 – 264 VAC					
Frequency	47-63 Hz	47 - 63 Hz					
Generator Start-up time	< 1 minute	< 1 minute					
NO in Rack Battery Back-up Unit (BBU) Present					within hold up time of the BBU at full load Supplied by Solution Provider		
Central, upstream UPS	Yes	Yes					
Central UPS redundancy	N+1	2N					
Required Power Quality							
Voltage (single phase)	180 – 264 VAC	180 – 264 VAC					
Frequency	47-63 Hz	47 - 63 Hz					
Generator Start-up time	Within central UPS runtime	Within central UPS runtime					
Cooling							
Mechanical							
must-have							
Rack airflow direction	Front to Back	Front to Back	Technology standard				
Air containment methods	Containment hot/cold applicable for all cabinets in white space	Hot aisle containment	Availability and energy efficiency reasons	Majority White Space is cold to enter and to perform maintenance without crossing hot aisles			
Minimum width cold aisle	1200 mm	??	Air flow capacity	To be advised by OCP rack development			
Minimum free width cold aisle (inside cage)	900 mm	??	Maintenance aisle with open door	To be advised by OCP rack development	Inside Cage		
Minimum width hot aisle	1200 mm	??	Air flow capacity	To be advised by OCP rack development	Remark for OCP rack/fan development: What is minimum aisle width between two racks on the hot aisle? Principle: Fans are powerful to block airflow from opposite cabinet by putting a static pressure at the back of opposite rack.		
Climate							
Inlet Air Temperature & Humidity allowed	Temperature set point: 80% of time ASHRAE recommended Temperature SLA: 100% of time ASHRAE allowable Humidity SLA: ASHRAE allowable + non condensing on servers	Temperature set point: 80% of time ?? , see remark Temperature SLA 100% of time Allowable Humidity optimum: Same as acceptable	Energy efficiency	Energy efficiency	 * Remark: Key to understand is the algorithm of the fans in the rack. They will ramp up fast if they don't get the right temperature. This will increase the fan power used with factor 3. * Suggestion: Need discussion with IT hardware development group to define optimum inlet temperature. I like to contribute these discussions.		
Cabinet blanking open slots	Mandatory for all cabinets int white space	Same as acceptable	Availability and energy efficiency reasons				
DeltaT	12	To be developed	Energy efficiency	Energy efficiency	* As per suggestion above. Good to understand the control algorithm in the OCP hardware. Does it have a KPI to maximize delta T over the rack as this improves the power usage.		
considerations							
Rack POD space planning in White Spaces	To be developed	To be developed			Remark for OCP POD development: Standard POD dimension (minimum/maximum number of racks)		
Air Quality (Particles/Air filtering requirements)	To be developed	To be developed			To be discussed with IT hardware and IT internal cooling development		
Telecommunications Cabling, Infrastructure, Pathways and Spaces							
Cabling Pathways & Spaces							

OCP data center project - colo facility requirements for open racks_checklist rev (01) 02 Mar 17	Acceptable	Optimum	Note Reasoning Acceptable	Note Reasoning Optimum	Facility Suitability Guidance Notes	Checklist Notes
must-have						
Bottom and top entry into Racks for power and network connectivity	Top or bottom & front of rack fed	Top & front of rack fed				
considerations						
Clearance between TOR to ceiling for two levels of containment						
Level one - Intra POD cabling						
Level two - Inter POD cabling						
Tertiary cabling pathway for OOB network (Level two)						
Pathway Construction						
Wire basket	Min size	Optimum size			This needs to be calculated for a "typical" installation. For example Level one should be designed for a 32 rack POD and Level two for a 10 POD capacity	
Wire basket support						
Cabling						
Fibre Cable Construction						
Flame rating	OFNP / LSZH				Fire rating as per local fire codes	
Structure					All Dielectric, aramid yarn strength members	
Fibre count					Multiples of 8	
Fibre Type						
Multimode	OM3	OM4				
Single Mode		OS2				
Patch Panels						
Location	TOR	TOR or fixed to underside of basket				
Connector presentation		Interchangeable LC and MPO				
Connector density	LC - 24 pairs per 1U MPO - 24 per 1U	LC - 48 pairs per 1U MPO - 48 per 1U			can be presented in 4U housings but should maintain the density at a minimum	
Colour		Light colour (white / light grey)				
Copper						
Category	Cat6	Cat 6a				
TOR/Leaf to Server/Storage Connectivity						
Direct Attach Copper (DAC)						
TOR/Leaf to Server/ Storage Connectivity						
TOR to Leaf connectivity						
Active Optical Assembly (AOC)						
TOR to Leaf connectivity						
Leaf to spine connectivity						
Network Infrastructure						
considerations						
Spine & Leaf Network					Facebook is not a CLOS - there is a 1:3 contention in the TOR (4 up, 12 down). The tenant will have their own network design (except MMR to the rented space)	
Max Link distance Spine to Leaf		300m				
Switch Location						

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Spine	TOR		MDA				
Leaf			HAD				
TOR Switch							
Transmission speed			10Gb/s or 40Gb/s or 100Gb/s				
Port Count			16, 24, 32 or 48				
Leaf Switch							
Transmission speed			40Gb/s or 100Gb/s				
Port Count			16, 24, 32, 48 or 64				
Spine Switch							
Transmission speed			40Gb/s or 100Gb/s or 400Gb/s				
Port Count			16, 24, 32, 48 or 64				
Media							
TOR/Leaf to Server/ Storage Connectivity (Intra Rack)	Twisted Pair		DAC / Fibre				
TOR to Leaf connectivity (Intra Pod)	DAC		AOC / Fibre				
Leaf to spline connectivity (Inter Pod)	N/A		Fibre				