

## Spesifikasi

Tajuk Templat:

TECHNICAL SPECIFICATION FOR INTERNET BROADCASTING  
SYSTEM (RTMKLIK 3.0) FOR THE DEPARTMENT OF BROADCASTING  
MALAYSIA FOR THREE (3) YEARS

Jenis Item:

Perkhidmatan

Jenis Barangan:

Tempatan

Item	UOM	Kekerapan / Unit Ukuran	Bil. Unit Ukuran Sehari	Bil. Unit Ukuran Sebulan	Kuantiti
	Spesifikasi				
<b>1.0 Preliminary Works</b>	PACKAGE	1			1
	1.1 Please specify Preliminary Works duration in Schedule of Equipment (SOE)				
<b>2.0 Managed Internet Services</b>	PACKAGE	12			1
	2.1 Managed Internet Services to comply with specification below : i) Technology : Leased line ii) Capacity : 300Mbps x 2 lines iii) Configuration : Active - Active iv) Effective bandwidth : 600Mbps v) Fallback : 300Mbps (auto-switch) vi) Monitoring : Online web based vii) Public IP : 2 lines x 128 IP address IPV4 Please specify Managed Internet Services capacity in Schedule of Equipment (SOE).				
	2.2 Service Level Guarantee 99.95%				
	2.3 Two (2) different Internet Service Provider (ISP) of exchange or route in high availability Please specify and propose Internet Services Provider (ISP) in Schedule of Equipment (SOE)				
<b>3.0 Integrated Services Router</b>	PACKAGE	12			1
	3.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	3.2 Integrated Services Router to comply with specification below : Router x 2 unit i) WAN Speed : Min 300 Mbps (or better) ii) Traffic Management : QoS, Hierarchical QoS iii) Data Throughput : 1 Gbps to 2 Gbps iv) Memory : 8 GB or better v) SFP Port : 2 units/slots vi) WAN Ports : Min 3 x Gigabit Ethernet vii) Power Supply : Redundant Security : i) IP Base + Advanced Security: Zone-based firewall ii) IPsec VPN iii) EzVPN iv) Dynamic Multipoint VPN (DMVPN) v) FlexVPN				
<b>4.0 Managed WAN Load</b>	PACKAGE	12			1
	4.1 Please specify Equipment Brand, Model, Country of Origin in Schedule				

<b>Balancer</b>	of Equipment (SOE)				
	4.2 Managed WAN Load Balancer to comply with specification below : Load Balancer x 2 unit i) WAN Interface : 5 GE + 2 USB Ports ii) LAN Interface : 3 GE Ports iii) Data/Stateful Firewall Throughput : Minimum 1.5 GBS iv) High Availability : Yes v) Incontrol2 Central Management : Yes				
<b>5.0 Managed Internet Security</b>	PACKAGE	12			1
	5.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	5.2 Managed Internet Security to comply with specification below : Firewall x 2 unit i) Next Generation Firewall consists of antivirus gateway, antimalware, intrusion prevention system (IPS), application control, network security and web security ii) IPV4 Firewall Throughput : minimum 70 Gbps iii) IPS Throughput : 14 Gbps or better iv) NGFW Throughput : 11.5 Gbps or better v) Interface : 1 x Console port, 2 x GE RJ45 MGMT/HA port, 16 x GE RJ45 , 8 x GE SFP Slots , 4 x 10GE/GE SFP+/SFP Slots vi) Redundant Power Supply vii) High Availability : YES viii) Modular Size : Rack mounted				
<b>6.0 Network Switch</b>	PACKAGE	12			1
	6.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	6.2 Network Switch x 2 unit i) Must support 1.5 Tbps Routing/Switching capacity ii) 48 x 1/10 Gbe Base-T ports iii) 6 x 40/100 Gbe QSFP/QSFP28 ports iv) Latency : 1 – 3.8 µsec v) Size Rack Unit /Form Factor : 1U vi) VLAN : VLAN support for tagging and port-based as per IEEE 802.1Q; Double VLAN tagging (QinQ vii) Availability a) Spanning Tree (IEEE 802.1D) and Rapid Spanning Tree (IEEE 802.1W) with fast link support b) Multiple spanning tree (IEEE 802.1s) Supports Virtual Redundant Routing Protocol (VRRP) viii) Security a) IEEE 802.1x based edge authentication b) Switch access password protection c) User definable settings for enabling or disabling Web, SSH, Telnet, SSL management access d) Port-based MAC Address alert and lock down ix) Management a) Web-based management b) CLI				
<b>7.0 Content Delivery Network (CDN)</b>	PACKAGE	12			1
	7.1 Please specify the CDN cost in Ringgit Malaysia (RM) in Schedule of Equipment (SOE) and Schedule of Compliance (SOC) in clause 4.13.6 and 4.13.7 a) 1 GB b) 133.2 PB				
	7.2 Please specify the CDN top-up cost in Ringgit Malaysia (RM) in Schedule of Equipment (SOE) a) Bundle CDN topup b) Burstable CDN topup				
<b>8.0 Content Management</b>	PACKAGE	12			1

<b>System</b>	8.1 Please state the URL link for the proposed content Management System (CMS) in Schedule of Equipment (SOE)				
	8.2 Content Management System to comply with specification below : i. Access : Online Web Based ii. User ID : Unlimited user accounts iii. Functionalities : CMS Functionalities to comply clause 5.5.2.1 in Schedule of Equipment (SOE) iv. Security : Password a) User privilege based on user roles v. Duplicate Entry : Prevented vi. System a) Single Sign-On. b) Hosted in multiple server c) API Integrated from multiple system including Audio Video Recorder, Online editing, and etc. vii. CMS Access : Cloud Services				
<b>9.0 Live Streaming Services</b>	PACKAGE	12			1
	9.1 To comply clause 5.6.1 to 5.6.10 in Schedule of Compliance (SOC) i) Concurrent Viewer : 50,000 (minimum) ii) Technology Support : RTMP, RTSP, HDS, HLS, MPEG-DASH, Smooth Streaming and latest technology iii) Video Encoding : H.264 H.265 (HEVC) iv) Audio Encoding : AAC and HE-AAC v) Publishing : Encoder push to CDN vi) Streaming Mode : Multi Bit Rate vii) Profile Per Channel : 5 profiles (240p, 360p, 480p, 720p, 1080p) viii) Frame Rate : 25fps ix) TV Channels : 30 x) Radio Channels : 36 and allow for future expansion. xi) Multi-screen Multi-platform : a) Computer, tablet, smartphone and gadget b) Smart TV and Android TV c) Android, iOS, Windows Phone etc. d) Microsoft Windows, Apple OSX, Linux etc.				
<b>10.0 Audio Video On Demand (AVOD) Services</b>	PACKAGE	12			1
	10.1 Audio Video On Demand Services to comply with specification below : i) Cloud Storage : 25TB (auto sync with Local Storage) ii) Video Format : MP4, MPEG-DASH iii) Video Encoding : H.264, H.265 iv) Audio Encoding : AAC (Advance Audio Codec) v) VOD Video Profiles : 5 profiles (240p, 360p, 480p, 720p, 1080p)				
<b>11.0 Audio Video On Demand (AVOD) Server</b>	PACKAGE	12			1
	11.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	11.2 Audio Video On Demand (AVOD) Server to comply with specification below : i) Processor : Intel Xeon Gold 6430 or better ii) Memory : 64GB or better iii) Storage : Enterprise NVMe SSD dengan RAID or better iv) Network : 2 x Gigabit Ethernet v) Form Factor : 2U rack, sliding rail kit included vi) Operating System : Windows Server 2022 Standard/Datacenter or Linux vii) Power Supply : Redundant				
<b>12.0 Transcoding Server</b>	PACKAGE	12			1
	12.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	12.2 Transcoding Server to comply with specification below : i) Processor :				

	2x Intel Xeon 6 processors ii) Memory : 2x 64GB DDR4 RDIMM RAM 3200MHz iii) Storage : 2x 2.5" 480GB SATA SSD iv) Network : 2 x 10 Gigabit Ethernet v) Form Factor : 2U rack, sliding rail kit included vi) Operating System : Windows Server 2022 Datacenter / Linux Enterprise (RHEL/SUSE) vii) Power Supply : Redundant viii) GPU : 2x NVIDIA L4 24GB GPU Card			
<b>13.0 Audio Video Transcoder</b>	PACKAGE	12		1
	13.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)			
	13.2 Audio Video Transcoder to comply with specification below : i) Type : Application ii) Integration : AVOD Server and AVOD Local Storage iii) Allow for : a) Set compression rate and standard b) Set resolution of output file c) Set frame rate of output files d) Set transcoding from Time Code (Mark In Mark Out) e) High quality compression for HD content conversion f) Create thumbnail for each audio video file			
<b>14.0 Media Server</b>	PACKAGE	12		1
	14.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)			
	14.2 Media Server to comply with specification below : i) Processor : 4th Gen. Intel Xeon Gold 6430 Scalable ii) Memory : 64GB DDR5 or better iii) Storage : 2 × 960GB NVMe Enterprise SSD or better iv) Network : 2 x Gigabit Ethernet v) Form Factor : 2U rack, sliding rail kit included vi) Operating System : Windows Server 2022 Standard/Datacenter or linux vii) Power Supply : Redundant			
<b>15.0 PodCast Terminal</b>	PACKAGE	12		1
	15.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)			
	15.2 PodCast Terminal to comply with specification below : Podcast Terminal x 8 unit i) Processor : 7th Generation Intel® Core™ i7-7700 ii) Memory : 16 GB DDR4-2400 non-ECC registered SDRAM iii) Storage : 1 TB 7200 rpm SATA iv) Network : Integrated Intel® I219LM PCIe GbE v) Optical Drive : Slim SATA DVD-RW vi) Form Factor : Tower vii) Operating System : Windows 10 Pro 64 bit viii) Power Supply : 400 W 92% efficient, wide-ranging, active PFC ix) Monitor : 19' or higher			
	15.3 PodCast Terminal shall Pre Install Software (Latest Version) : i) Adobe Photoshop ii) Adobe Illustrator iii) Adobe Audition iv) Anti Virus v) Microsoft Office			
	15. 4 Accessories i) Microphone : a) Type : Dynamic (Moving coil) b) Polar Pattern : Unidirectional (Cardioid) c) A/D Converter : 16 or 24 bit, 44.1 or 48 KHz d) Frequency Response : 50 Hz to 16 000 Hz e) Adjustable Gain Range : 0 to +36 dB f) Connector Type : Micro-B USB and XLR ii)			

	Headphone a) Headphone Type : Close-back b) Driver size : 50mm c) Voice Coil : Pure OFC voice coil d) Frequency Response : 5Hz to 14 000 Hz e) Sensitivity (SPL) : 114 dB SPL/V A @ 1kHz f) Impedance : 32 ohms iii) Speaker : a) Total watts (RMS) : 40W b) Subwoofer : 24W c) Satelites : 2 x 8 W d) Input : 3.5mm jack, RCA and headphone jack			
<b>16.0 MAM Terminal</b>	PACKAGE	12		1
	16.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)			
	16.2 MAM Terminal to comply with specification below : MAM Terminal x 2 unit i) Processor : 13th Gen Intel® Core™ i5-1334U, 10 cores ii) Memory : 16 GB DDR5 iii) Storage : 512 GB SSD iv) Network : 1 RJ45 Ethernet port v) Optical Drive : Slim SATA DVD-RW vi) Form Factor : Tower vii) Operating System : Windows 10 Pro 64 bit viii) Power Supply : 400 W 92% efficient, wide-ranging, active PFC ix) Monitor : 19' or higher			
<b>17.0 Cloud Web Hosting</b>	PACKAGE	12		1
	17.1 Cloud Web Hosting to comply clause 4.13.2 in Schedule of Compliance (SOC) Please specify Cloud Provider details in Schedule of Equipment (SOE) a) Cloud Provider b) Cloud Region Provider Selection: The CDN provider must be a recognized "Leader" in the Gartner Magic Quadrant for Content Delivery Networks or a similar, globally acknowledged analyst report. The Tenderer must specify the chosen provider and their position in the latest available report. The tenderer must name an internationally established and well-known CDN provider such as Microsoft, Google, TM, and AWS.			
	17.2 Cloud Web Hosting to comply with specification below : i) Optimization of access : a) Web and mobile application b) Database c) Content ii) Load balance : Yes iii) Storage : 5TB iv) Redundancy : High Availability v) Virtual Private Server : Accessible from RTM vi) Uploading mechanism : FTP			
	17.3 Server access to comply with specification below : i) Method: Cpanel, FTP, SSH, SCP ii) Secured login iii) Multi level security for different tasks. iv) Control access to data, based on user roles defining which information users or user groups can view, edit, publish, etc. v) Web Hosting Manager			
<b>18.0 TV Encoders</b>	PACKAGE	12		1
	18.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)			
	18.2 TV Encoders features to comply clause 5.15.7 in Schedule of Equipment (SOE)			
	18.3 TV Encoders specification to comply clause 5.15.8 in Schedule of Equipment (SOE)			

<b>19.0 Radio Encoders</b>	PACKAGE	12			1
	19.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	19.2 Radio Encoders to comply with specification below : i) Input a) Digital : AES XLR b) Digital: Livewire AoIP, via LAN port ii) Output a) Digital: AES XLR b) Analog: Balanced XLR iii) Audio Codec : MP3, AAC-LC, HE-AAC, HE-AAC V2 iv) AAC Transport : ADTS, ADTS-CRC, ADIF, RAW v) Metadata Support : Character Parser Sample, Line Parser Sample, Nexgen Audio Sense, Simian Template 1, XML Parser Sample, XML-Jazler, XML-Jazler2, XML-MediaTouch, XML-MediaTouch2, XML-Sample2, XML-Zetta, User-definable vi) Ethernet port : 2 (LAN WAN) v) Streaming Support : ICEcast, SHOUTcast, SHOUTcast v2, Adobe Flash Media Server and WOWZA Media Server, RTP, LimeLight and Akamai iv) Form Factor : 1RU v) System Control : Web Based GUI				
<b>20.0 Portable Audio Video Encoders</b>	PACKAGE	12			1
	20.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	20.2 Portable Audio Video specification to comply clause 5.17.15 in Schedule of Compliances (SOC)				
<b>21.0 Video Payout System</b>	PACKAGE	12			1
	21.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	21.2 Video Payout System to comply with specification below : i) Input a) SDI ports b) DV/HDV c) IP Live video input d) Non-DirectShow integration ii) Output Channels : 3 dedicated channels iii) Playback Support a) H.265, H.264, MPEG-2, M-JPEG, MPEG-4 video b) MXF, MP4, QuickTime, AVI, WebM, MPEG-2 PS, MPEG-2 TS file formats c) HTTP, RTMP, RTP, UDP network protocols iv) Video Encoding a) H.265, H.264, MPEG-2, M-JPEG, MPEG-4 video b) MXF, MP4, QuickTime, AVI, WebM, MPEG-2 PS, MPEG-2 TS file formats c) HTTP, RTMP, RTP, UDP Video Payout System to comply with specification below : v) Audio Encoding : MPEG-1 Layer II, E-AC-3, AAC-LC/HE-AAC v1/v2 vi) Character Generator a) News tickers (crawls and rolls) b) On-air Editing c) Graphics and alpha video overlay. d) Scalable Vector Graphics (SVG)				
<b>22.0 KVM Switch</b>	PACKAGE	12			1
	22.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	22.2 KVM Switch to comply with specification below : KVM Switch x 2 unit i) Total Port : 16 ports per KVM set ii) KVM Cables : 16 sets per KVM set iii) Monitor : 19' LCD, fold-down flat panel iv) Keyboard and Mouse : Integrated/included v) Keyboard Tray : Slide out extension mounting				



	brackets vi) Size: 1RU rack-mountable vii) Access : a) TV Encoders b) Radio Encoders c) AVOD Server d) Local Storage				
<b>23.0 Audio Distribution Amplifier (ADA) MultiFrame</b>	PACKAGE	12			1
	23.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	23.2 Audio Distribution Amplifier (ADA) MultiFrame shall has the capacity to hold up to 20 single-slot modules or equivalent and to comply with specification below : i) Dimensions (H x W x D) 3.5 x 19 x 11.5 in. (8.8 x 48.3 x 29.2 cm) ii) Input Voltage 100 to 250 VAC ( $\pm 10\%$ ) iii) Frequency 47 to 63 Hz iv) Input Current a) 2 ARMS maximum at 90 VAC, 120 W output power b) 0.75 ARMS maximum at 274 VAC, 120 W output power v) Output Power 130 W (including fans)				
<b>24.0 Digital Audio Distribution Amplifier (ADA) Card</b>	PACKAGE	12			1
	24.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	24.2 Digital Audio Distribution Amplifier (ADA) Card to comply with specification below : i) Dual 1x4 AES changeover or single 1x8 distribution amplifier ii) Balanced inputs/outputs 110 ohms iii) Supports clock signals between 30 KHz to 192 KHz compatibility (independent for each input channel) iv) Supports reclocked outputs v) Balanced input, 110R $\pm 20\%$ impedance, maximum input amplitude 7 V pk-pk vi) Balanced output, 110R $\pm 20\%$ impedance, output amplitude 2 to 7 V pk-pk into 110R load vii) Fully isolated transformer coupled inputs and outputs				
<b>25.0 Digital Audio Monitor</b>	PACKAGE	12			1
	25.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	25.2 Digital Audio Monitor to comply with specification below : i) Input : 8 analogue or AES/ EBU digital channels (auto selecting) ii) Max level (0dB input gain) : +18dBu (analogue)/0dBFS (digital) iii) AES/EBU Sample Rate : 32 to 192kHz, converted internally to 48kHz iv) Input Gain : 0, +6, +12 or +18dB digital gain (switchable) v) Audio Outputs : 1 x stereo analogue or AES/EBU digital (switchable) vi) Level Metering : 4 x 26-segment tri-colour LED bargraphs vi) Connector a) Input - 8 x XLR 3-pin female (balanced, may be unbalanced) b) Output - 2 x XLR 3-pin male (balanced, may be unbalanced) c) 1/4" (6.35mm) A-gauge 3-pole stereo jack socket				
<b>26.0 Monitoring Devices</b>	PACKAGE	12			1
	26.1 Please specify Equipment Brand, Model, Country of Origin in Schedule of Equipment (SOE)				
	26.2 Monitoring Devices to comply with specification below : MacOS x 6 unit i) Apple M4 chip with 10-core CPU, 10-core GPU, 16-core Neural				

	Engine ii) 16GB unified memory iii) 512GB SSD storage iv) 14-inch Liquid Retina XDR display v) Backlit Magic Keyboard with Touch ID - US English vi) Touch ID vii) Force Touch trackpad viii) Three Thunderbolt 4 (USB-C) ports ix) Comes with USB C HUB Type C to HDMI-compatible USB 3.0 Adapter 8 in 1 Type C HUB Dock x) Magic Mouse xi) Comes with Microsoft Office and Acrobat Pro			
	26.3 Monitoring Devices to comply with specification below : MacOS x 1 unit i) Apple M4 Max chip with 14core CPU, 32core GPU and 16core Neural Engine ii) 36GB unified memory iii) 1TB SSD storage iii) 16-inch Liquid Retina XDR display iv) Three Thunderbolt 5 ports, HDMI port, SDXC card slot, headphone jack, MagSafe 3 port v) Touch Bar and Touch ID vi) Backlit Magic Keyboard with Touch ID - US English ix) Comes with USB C HUB Type C to HDMI-compatible USB 3.0 Adapter 8 in 1 Type C HUB Dock x) Magic Mouse xi) Comes with Microsoft Office and Final Cut Pro X			
<b>27.0 Integration with Media City Development</b>	PACKAGE	1		1
	27.1 Integration works to comply the clause 5.4.1 until 5.4.8 in Schedule of Compliances (SOC)			
<b>28.0 On Site Training And Professional Development</b>	PACKAGE	1		1
	28.1 On-Site Training to comply the clause 3.13.1 until 3.13.8 in Schedule of Compliances (SOC)			
	28.2 Professional Development to comply the clause 4.21.4 in Schedule of Compliances (SOC)			
<b>29.0 Documentation</b>	PACKAGE	1		1
	29.1 As-Built Drawings to comply the clause 4.20.2 in Schedule of Compliances (SOC)			
	29.2 Inventory List containing all equipment components complete with Brand Name, Model, Serial Number and location for every facility installed at RTM's premises that make up the full system must be submitted in soft copies and hard copies. This shall be submitted together with the commissioning documents.			
	29.3 System and Migration Documentation to comply the clause 4.20.3 in Schedule of Compliances (SOC)			
	29.4 Technical Documentation to comply the clause 4.20.5 in Schedule of Compliances (SOC)			